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IBM going multiprotocol at INTEROP

By Michael Cooney
Senior Editor

WASHINGTON, D.C. — IBM is planning a show of multiprotocol networking force next week with the unveiling of software that lets existing applications work with a variety of transport networks.

At INTEROP 93 Spring here, IBM will also be hosting an Advanced Peer-to-Peer Networking interoperability demonstration with vendors such as Data Connection, Ltd., a company that is developing APPN code it plans to sell to other vendors and users (see "U.K. firm to deliver APPN code for OEMs," page 8).

At the heart of IBM's announcement will be the debut of the first Multiprotocol Transport Networking (MPTN) products, including an implementation of MPTN for the OS/2 platform and third-party MPTN-compliant products for the MVS mainframe.

Announced last March as one of the central components of IBM's Networking Blueprint, MPTN is IBM software that sits between the data transport and session layers ("IBM gives its net-

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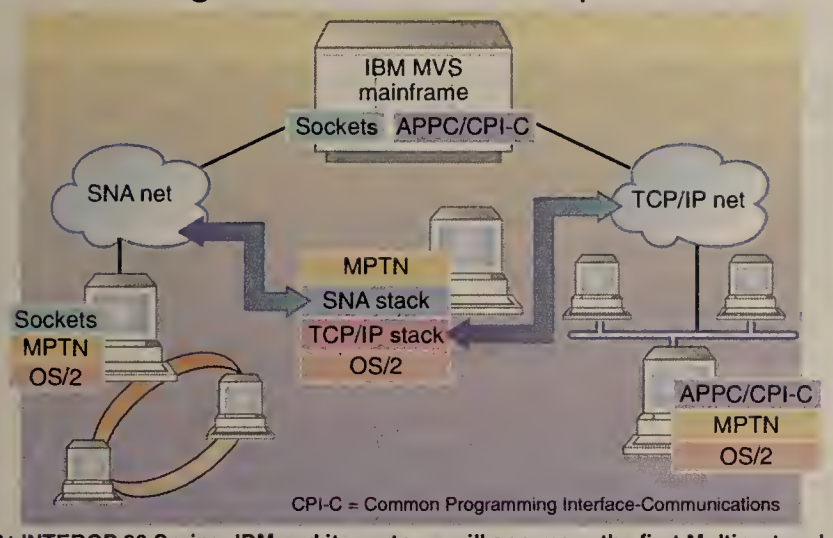
IBM to give users their independence



At INTEROP 93 Spring, IBM and its partners will announce the first Multiprotocol Transport Networking (MPTN) products, software that fosters communication among applications independent of underlying transport protocols.

GRAPHIC BY SUSAN SLATER | SOURCE: IBM, WHITE PLAINS, N.Y.

Defense industry sees nets as cushion in hard times

By Bob Brown
and Joanne Cummings
Network World Staff

Faced with deep cutbacks in military spending and a downturn in the commercial airline market, defense and aerospace companies are struggling to adjust to new economic realities and are being forced to reexamine the role networks will play in their business strategies.

In an industry beset with layoffs and losses, some firms are honing their nets as strategic weapons in the fight for a greater share of a shrinking market pie and to support forays into new markets. Others, such as General Dynamics Corp. and McDonnell Douglas Corp., have moved to cut information systems expenditures through outsourcing.

Net managers at aerospace and defense companies agree that networks will help them in their efforts to diversify, convert

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Newbridge painting a VIVID net portrait

Mux maker plans foray into ATM local-area networks with hub, adapters and gateways.

By Jim Duffy
Senior Editor

HERNDON, Va. — Newbridge Networks, Inc. is planning an aggressive push into the ATM LAN arena with an array of low-cost products to bring ATM to users' desktops.

Included are Asynchronous Transfer Mode network interface cards (NIC) and software for

SynOptics, SMCC join on ATM adapter cards, page 2.

workstations, gateways to connect existing shared media local-area networks to ATM nets and an ATM switching hub. The products are intended to help users gradually migrate to ATM.

The product line — dubbed VIVID, for video, voice, image and data — is scheduled to be officially unveiled at INTEROP 93 Spring next week.

VIVID products were developed to harness the increasing power on users' desktops to support such applications as image, voice, video and computer-aided design and manufacturing, said Brian NeSmith, Newbridge vice president. Such applications require new networking techniques as existing hub and router imple-

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NetWare users to get help with software licensing

By Fredric Paul
Senior Editor

PROVO, Utah — In a deal that could dramatically reshape how LAN applications are used, sold and paid for, Novell, Inc. last week announced an agreement to add Electronic Software Licensing (ESL) services to NetWare 3.X and 4.X.

Wellfleet, Novell ink interoperability deal, page 3.

Novell will use Gradient Technologies, Inc.'s NetLS license server technology to create a NetWare Loadable Module (NLM) designed to support ESL services and release a software developers' kit (SDK) to help third-party developers build license-enabled NetWare applications.

The NLM license server will manage many aspects of software use, enabling corporate users to load servers with licenses that can be distributed on demand to clients with the proper authorization. The NetLS SDK will define a License Service application program interface (API) for application developers.

According to observers, the deal addresses a pressing but underpublicized concern for large users.

"It's not just the way you order and receive applications," said Elaine Bond, a fellow at The Chase Manhattan Bank, N.A. in

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DBMS rivals take aim at client/server

By Wayne Eckerson
Senior Editor

Relational database giants Informix Software, Inc. and Oracle Corp. this month will take aim at each other and the burgeoning client/server market with new tools serving a range of application development needs.

Both companies are announcing sets of graphical application development tools that include end user-oriented database query and rapid prototyping tools as well as more sophisticated products that help developers build complex multiplatform client/server applications.

"Database vendors realize it's a new world out there," said Wayne Kernochan, an analyst at Aberdeen Group, Inc. in Boston. "No longer is it enough to have the best [database] engine; they have to have the best tools, as well."

Informix this week will announce Windows software called ViewPoint, which includes a

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SynOptics braces ATM plan with rollouts, partnership

To release ATM switch, mgmt. products; to team with Sun on ATM workstation adapter.

By Bob Brown
and Skip MacAskill
Network World Staff

SANTA CLARA, Calif. — SynOptics Communications, Inc. will flesh out its Asynchronous Transfer Mode strategy this week with the announcement of its long-expected ATM switch, adapter cards jointly built with Sun Microsystems Computer Corp., and two management products.

Central to the strategy is SynOptics' new LattisCell ATM Switch, a 16-port device that will support dedicated 155M bit/sec ATM links. It is based on a 5G bit/sec Fast Matrix switching fabric — as opposed to the 2.5G capacity originally rumored — and a six-chip ATM chipset, which SynOptics jointly developed with St. Louis' Washington University.

The switch is aggressively priced at $1,495 per port for shielded twisted-pair/fiber or $1,995 per port for an all-fiber version.

The ATM switch will be rolled out in the third quarter.

SynOptics will complement the switch with the release in the fourth quarter of a low-cost adapter card for Sun workstations. Working together, the

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Artisoft delivers LANtastic 5.0 with major upgrades

Provides wider connectivity, support for large nets.

By Caryn Gillooly
Senior Editor

TUCSON, Ariz. — Artisoft, Inc. last week released a major upgrade of its LANtastic software that makes it easier for users to build and manage big networks with the peer-to-peer LAN operating system.

LANtastic 5.0 provides new connectivity options — such as the ability to bridge to Novell, Inc. NetWare and Unix nets — as well as improved administration, printing and security features. The new version also supports as many as 500 users per net, up from 300 users.

And, perhaps as important as the enhancements, Version 5.0 does not take up any more memory than Version 4.1.

"Memory was a major consideration for us," said George Hoffman, associate director of the intensive care unit of the Critical Care and Anesthesia section of Children's Hospital in Milwaukee, a beta site for LANtastic 5.0. "The new release does more than the old version in the same amount of memory."

LANtastic's new multiplatform connectivity features are provided by bridged redirectors.

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BT sets goal to expand access to packet net service

By Bob Wallace
Senior Editor

SAN JOSE, Calif. — BT North America, Inc. last week detailed a two-year plan to broaden the types of access available for its packet net service to meet the needs of an increasingly distributed and mobile work force.

BT's network blueprint calls for support of dial-up links at speeds up to 28.8K bit/sec, the ability to use a toll-free 950 number for access, and wireless, switched digital and fractional T-1 access support.

"BT customers will be ecstatic about this announcement because it shows BT is committed to supporting an all-encompassing array of access options," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy.

BT currently provides 520 access points to its X.25 packet network in 110 U.S. cities, but only 120 of those support dial access at 9.6K bit/sec. Under the BT plan, all sites will support this speed by the end of 1994.

The top 100 or so major metropolitan areas — used by roughly 80% of BT's customers — will be the first to get the higher

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Briefs

Network World needs your help. We're developing a new reader service dubbed the Network Help Desk in which we will solicit answers to readers' questions regarding everything from products and services to discrepancies with vendors. Questions will be answered by integrators, consultants, vendors, educators or researchers. Submit queries to Susan Collins by calling (800) 622-1108, faxing to (508) 820-3467, or sending electronically via the BBS (see instructions below) or the Internet at Network@World.std.com.

Vendors increase Telnet efficiency. At the INTEROP 93 Spring show next week, Hewlett-Packard Co., The Wollongong Group, Inc. and Datability, Inc. will announce an extension to the Transmission Control Protocol /Internet Protocol Telnet terminal-emulation standard that will enable networks to support a greater number of users in on-line transaction processing (OLTP) environments. Called Telnet/OLTP, the extension will reduce host Telnet CPU utilization by 50%, freeing up additional processing cycles for OLTP applications and Telnet traffic by 90% so the network can support additional traffic.

Driving NetWare 4.0. Novell, Inc. last week announced that NetWare-certified drivers from 22 companies will ship with NetWare 4.0, expected to be announced next week at INTEROP 93 Spring in Washington, D.C. The new drivers, which will enable customers to take advantage of the increased functionality of 4.0, will be based on the Open Data-Link Interface and will be free of charge. Some of the companies that will release drivers include Cabletron Systems, Inc., Hewlett-Packard Co., IBM, Intel Corp., Proteon, Inc. and 3Com Corp.

Interop names '94 sites. The Interop Co. last week announced that its NetWorld+Interop 94 trade shows will take place May 4-6 in Las Vegas and Sept. 12-14 in Atlanta. The shows will replace the annual INTEROP Spring and INTEROP Fall trade shows, which were held in Washington, D.C. and San Francisco, respectively.

SunNet Manager to move to Solaris. SunConnect, a unit of Sun Microsystems, Inc., will announce at INTEROP 93 Spring that it will port its SunNet Manager network management system to the Solaris 2.X operating system. Solaris 2.X is the latest version of Unix System V Release 4 running on Sun SPARCstations. The company said it plans to ultimately move SunNet Manager to other Unix hardware platforms.

Alternative carriers press forward. MFS Communications Company, Inc. last week cut over a 66 route-mile Synchronous Optical Network (SONET) in Atlanta, a move that will position the carrier to offer high-speed net services at a minimum speed of 51.84M bit/sec. The carrier said that most of the connections into and out of the SONET network will be at T-1 and T-3 speeds.

Competitor Teleport Communications Group, Inc. announced the inauguration of its eighth fiber-optic alternate access net, which is a 40-route-mile net in Omaha, Neb.

Telco goes SONET. The Chesapeake and Potomac Telephone Co. of Virginia, a Bell Atlantic Corp. local exchange company, said it has installed a Synchronous Optical Network fiber-ring system at two central offices and four remote sites in the Crystal City, Va., area. Customers on the net include the Department of Defense, Lockheed Corp., the Environmental Protection Agency and McDonnell Douglas Corp.

CONTACTS

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IDAPI specification shown in public for first time

Supporters provide feedback on the evolving spec.

By Wayne Eckerson
Senior Editor

AUSTIN, Texas — More than 30 companies met here last week for their first look at a draft specification of the Integrated Database Application Programming Interface (IDAPI) put forth by Borland International, Inc., IBM, Novell, Inc. and WordPerfect Corp. last November.

Based on the SQL Access Group's (SAG) Call-Level Interface (CLI), IDAPI seeks to provide a standard way for applications running on any platform to access SQL and non-SQL databases.

The 30-plus companies, all of which have committed to implementing IDAPI, include Computer Associates International, Inc., Gupta Corp. and Sybase, Inc. They provided feedback on the specification to Borland, Novell, IBM and WordPerfect, who will incorporate the suggestions in the next draft of IDAPI due out in May.

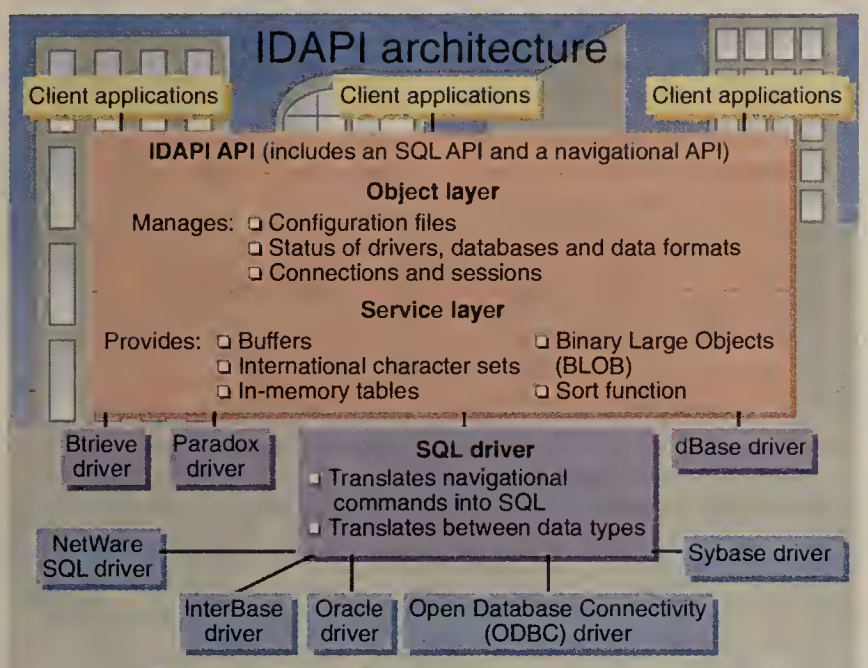
Many industry observers consider IDAPI to be in direct competition with Microsoft Corp.'s Open Database Connectivity (ODBC), which defines a standard API for accessing SQL databases from Windows-based applications.

The IDAPI partners insist ODBC and IDAPI are complementary technologies based on the same core SAG CLI specification. But they added that IDAPI has been architected from the ground up to be a multivendor, multiplatform API, whereas ODBC was designed specifically for Windows applications.

What's unique about IDAPI is that it not only provides a consistent API, but it also offers a robust set of database integration services. These services support many of the functions that applications and database driver developers would normally have to build into their products to make them work efficiently with multiple data sources.

Most notably, IDAPI services permit applications to integrate data from SQL databases and record-oriented or navigational databases, such as Novell's Btrieve and Borland's Paradox.

In addition, IDAPI supports scrollable cursors, Binary Large Objects (BLOB), data sorting, language conversions, record locking and cross database joins.



The Integrated Database Application Program Interface (IDAPI) consists of a high-level API and underlying services that provide a standard way for applications to access both SQL and non-SQL databases.

GRAPHIC BY SUSAN SLATER SOURCE: IDAPI STEERING COMMITTEE

IDAPI's modular structure makes it possible to add services in the future, such as naming and security.

"Embedding [data integration] services in a layer of middleware is what differentiates IDAPI from ODBC. We put intelligence into IDAPI, which relieves [independent software vendors]

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Wellfleet, Novell agreement focuses on interoperability

By Maureen Molloy
Senior Writer

BEDFORD, Mass. — Wellfleet Communications, Inc. last week announced it has teamed with Novell, Inc. in a joint development and support partnership to ensure that Wellfleet routers interoperate with Novell routers and servers.

The deal involves four key initiatives, including joint product development, interoperability testing, product support and network management.

"Our focus is on the backbone, and Novell's is on the access points of an internet," said Wellfleet President Paul Severino. "Combining our strengths, it will enable users to build large, interoperable nets using both our products."

Under the agreement, Wellfleet routers will be the first to support Novell's NetWare Link Services Protocol (NLSP), the next-generation of NetWare's Internetwork Packet Exchange (IPX) protocol that promises to vastly improve the scalability and performance of IPX-based internets. Roughly 80% of Wellfleet users currently use Novell's IPX.

NLSP is a link-state protocol designed to overcome the drawbacks of IPX, a distance vector protocol that has been criticized for its hop count limititations, excessive bandwidth consumption and cumbersome routing table update methods.

Key NLSP enhancements include its ability to support larger nets and optimal routing based on a number of variables. NLSP significantly trims the amount of data that routers need to exchange over the wide area by limiting routing table updates to when the network is actually changed. IPX, on the other hand, sends information about routes once every 60 seconds.

Also unlike IPX, where the best path is the one with the fewest hops between the source and destination, NLSP optimizes routing by permitting users to choose routes based on additional variables such as delay, line speed, and dollar cost. In addition, it permits unlimited hops between source and destination nodes, while IPX has a 16-hop limit.

Wellfleet will support NLSP on its routers by the third quarter.

Another key aspect of the agreement is that both vendors have committed to provide across-the-board interoperability between their respective products.

For example, they will work to ensure that Novell's software-based MultiProtocol Router is compatible with Wellfleet's router, including the way both support IBM and wide-area protocols, various routable transport

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CLI unveils Eclipse low-cost videoconferencing system

By Joanne Cummings
Senior Writer

NEW YORK — Compression Labs, Inc. (CLI) last week unveiled its long-awaited low-cost Eclipse videoconferencing system, a personal computer-based device that ranges in price from $14,990 to $19,900.

The company said that by reducing several components to single boards — including the coder/decoder, audio system and network interfaces — it was able to offer the same features as other units costing 50% to 70% more. In addition, the Eclipse offers new features, including wireless remote control and the ability to run internal diagnostics.

The Eclipse is targeted at users looking to expand their use of videoconferencing and at smaller firms that have not been able to cost-justify the average $50,000 videoconferencing system.

"This announcement puts CLI in a very good competitive position," said Sarah Dickinson, market analyst at Personal Technology Research, Inc. in Waltham, Mass. "This is the first truly small group videoconferencing system to hit the market that has all the necessary functionality at a price that small and midsize users can afford."

Dickinson said a big plus is the system's ease of use. According to CLI, the Eclipse is the first videoconferencing system to offer a remote control unit and graphical user interface (GUI), which makes it similar to operating a television.

For example, users can make a videoconference call by simply pressing the button on the remote unit marked "call" and choosing the site or person they wish to reach from a graphical menu on the monitor. The system automatically dials the site and begins the conference.

In addition, each time the unit is turned on, it runs a series of self-diagnostics, checking items such as whether the network connection is functioning or the codec is operating properly. Results of these tests can be accessed through the GUI, or, using the built-in modem, an off-site technicians can dial and download the data.

The system, which comes fully assembled on a cart, is available in two versions, the Model 8050 and 8100.

The Model 8050 consists of an 80486-based PC equipped with various video boards, a 40M-byte hard disk and 1.5M-byte floppy disk for handling software updates.

It supports the CCITT Px64 standard for conducting conferences with non-CLI systems and CLI's proprietary video compression algorithm for communicating with other CLI systems. The 8050 automatically switches to suit the device at the other end of the conference, CLI said.

The model has full-duplex audio with integrated echo cancellation, as well as built-in network interfaces for establishing conferences using switched digital services, private lines at speeds up to 128K bit/sec, or Integrated Services Digital Network services. It has an autofocus camera with pan, tilt and zoom features.

The high-end Model 8100 has all the features of the 8050, plus a stand-alone graphics camera for sharing charts, documents and whiteboard information, as well as Picture-In-Picture feature support, which allows users to preview video before sending it. The 8100 also comes ready to support CLI's Multipoint 2 multipoint bridge for linking several systems in one conference.

The Model 8050 will be available at the end of May, and the Model 8100 should be available by the end of April.

GOSIP conformance issue looms over users, vendors

Firm asks GAO to suspend bidding on data net.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — The General Accounting Office (GAO) will issue a ruling this spring on a protest over the use of the Government Open Systems Interconnection Profile (GOSIP), which will impact federal users and vendors alike.

Challenger Engineering, Inc., a small company in St. Petersburg, Fla., has asked the GAO to suspend the bidding on a data network for the U.S. Forest Service being handled through the General Services Administration's Federal Computer Acquisition Center (FEDCAC).

The company claims that the GSA's Forest Service request for proposal, which calls for products based on the Transmission Control Protocol/Internet Protocol and some based on OSI, violates the GOSIP procurement rules requiring federal agencies to buy OSI-based products. Products that fall under the GOSIP requirements include routers, 802.3 local-area networks and bridges, as well as electronic mail, file-transfer and terminal-emulation offerings.

Challenger also said the RFP's failure to require that the GOSIP products be listed on the GOSIP Register of certified products undermines the National Institute of Standards and Technology (NIST) conformance test program by giving vendors a loophole for avoiding the cost and effort involved in passing the accredited tests.

"The solicitation document allows [vendors] to propose products that are untested and noncertified with GOSIP Version 1, and may or may not offer GOSIP Version 1 functionality," Challenger's legal filing stated. "This is FEDCAC's clever attempt to avoid products that offer true GOSIP functionality."

> "This is FEDCAC's clever attempt to avoid products that offer true GOSIP functionality."
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Challenger said it also believes the government wants brand name products for the Forest Service net, specifically, routers, gateways and bridges manufactured by Dowty Communications, Inc. and Wellfleet Communications, Inc. However, both vendors have avoided compliance testing for GOSIP Version 1 because of the cost involved and the belief that the government will never require 'certified' products, the firm added.

"We feel that the government should be called to task on their own standards," said Sylvia Sachia, president and chief executive officer of Challenger.

An accredited GOSIP-conformance test laboratory, CDA, Inc. of McLean, Va., has submitted a filing with the GAO supporting Challenger's protest.

CDA said conformance tests should be required because GOSIP products claiming compliance to GOSIP have failed formal conformance tests.

This view corresponds with that of Jean-Philippe Favreau, head of the GOSIP test program, who has said that in NIST's view, only products that have been certified can be labeled GOSIP-conformant.

If the GAO rules in favor of Challenger, government buyers might find themselves under tighter restrictions. Several industry sources assert that government agencies buy both OSI and TCP/IP products but tend not to use OSI.

If GAO decides that only the products on the GOSIP Register satisfy the definition of GOSIP conformance, then users will find a short list of products from which to choose. There are only three vendors with 802.3-based products on the GOSIP Register: Control Data Systems, Inc., 3Com Corp. and Bull HN Information Systems, Inc. No routers have passed the accredited Connectionless Network Protocol tests yet, although some vendors, including Wellfleet and Cisco Systems, Inc., have said they are now doing testing.

If the GAO rules that certification is not required and that agencies may continue to buy non-GOSIP products, the GOSIP program will be immediately devalued as a way to induce vendors to support OSI.

Start-up announces first synchronous FDDI wares

By Skip MacAskill
Staff Writer

HYANNIS, Mass. — ALFA, Inc. last week rolled out the industry's first synchronous FDDI products, which are designed to make it easier for users to support multimedia applications over the high-speed local-area network.

The start-up, based here, unveiled a Fiber Distributed Data Interface concentrator and a line of adpater cards that enable devices to establish dedicated connections across an FDDI net for multimedia applications.

Synchronous FDDI supports a timing feature that delivers traffic at specific intervals, a key capability in multimedia systems. Digitized voice packets, for example, must be sent along the network every 125 microseconds or the sound will be distorted.

"With synchronous capabilities, users can do most of what they wanted to achieve with FDDI 2 and probably solve most of their current multimedia needs, such as videoconferencing and stored video applications," said Michael Howard, president of Infonetics Research, Inc., a market research firm in San Jose, Calif. "[ALFA] has this, but getting someone to use it will be the next big hurdle."

While synchronous capabilities have been in the ANSI X3T9.5 FDDI standard from the beginning, this is the first time a company has offered users a way to tap into that functionality.

"The need for these services on a LAN didn't exist two years ago," explained Steve Cooper, vice president of ALFA. "Before synchronous FDDI could happen, a number of things — such as less expensive storage and object-oriented programming — had to evolve. LANs are now ready for these services."

In order to access the synchronous capabilities embedded in ex-

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NSC lays out SNA plans and shows off new switch

By Maureen Molloy
Senior Writer

MINNEAPOLIS — Network Systems Corp. (NSC) last week detailed how it plans to improve SNA support on its router line and gave a preview of the combined router/Asynchronous Transfer Mode (ATM) switch it is scheduled to unveil next week.

The vendor's long-term Systems Network Architecture strategy involves elements similar to those outlined by other router vendors, including encapsulation of SNA data in Transmission Control Protocol/Internet Protocol packets and Synchronous Data Link Control-to-802.2 Logical Link Control 2 (LLC2) conversion capabilities.

But unlike other vendors, NSC is the first to announce plans to enable its DXE family of routers to be configured as IBM 3172 Interconnect Controllers, a device used to link local-area networks to mainframe channels. It is also the first to outline plans to encapsulate nonroutable IBM protocols in Advanced Peer-to-Peer Networking packets for transport across router-based internets.

These features will be available on the vendor's existing DX and DXE line of routers as well as its Enterprise Router Switch (ERS), a combination router/ATM switch that will be announced at INTEROP 93 Spring next week ("Network Systems reveals ATM plan," *NW*, Feb. 1).

Today, NSC's SNA support consists of the 4100, an SDLC-to-LLC2 conversion device from Netlink, Inc. that NSC resells. The 4100 translates SDLC data into LLC2 frames that are then sent across an internet to a token ring-attached mainframe.

In Phase 1 of the company's new SNA plans, NSC will add token-ring support to its 6400 and 6800 routers — the 6600 already supports token ring — and will release a native NetView agent that will enable its routers to be monitored from an IBM NetView management console.

By year end, the router will be equipped with IBM 8209 Token-Ring-to-Ethernet translating bridge software that will allow users to bridge traffic between Ethernet and Token-Ring LANs. In this second phase, NSC will also push SDLC-to-LLC2 conversion functions inside the router.

Phase 3, which is scheduled for the first half of next year, will enable users to configure an NSC router as an IBM 3172, giving users an alternative means of sending data to a mainframe.

In the fourth phase, to be completed by the end of next year, NSC will add support for IBM's

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AT&T 800-routing feature supports rotary phones

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week announced a network-based voice response feature for its 800 service that will enable customers with rotary phones to use spoken commands to respond to call routing queries.

With the feature, dubbed AT&T 800 Speech Recognition, businesses can use the AT&T network rather than on-site equipment to direct calls from consumers with rotary telephones.

AT&T is the first of the Big Three to announce this type of feature, which could help the company differentiate its toll-free services in the war for customers that is expected to break out when 800 portability takes affect in May. The feature is scheduled to become available in April.

Although the company already offers a network-based voice response feature that enables consumers with push-button phones to key in call routing requests, users with rotary phones are forced to wait in queue in order to speak with an operator. Advanced Telecom Services Group, a market research firm in Wayne, Pa., estimates that about 39% of all phones in the U.S. are rotary phones.

"The new feature sounds great," said Ed Hodgson, director of computing and communications for Schindler Elevator Corp. "We have field sales and installation managers calling in on our AT&T 800 number for the status of customer orders. And we don't want them restricted to only calling in on [push-button] phones."

New market, cost savings

"We're opening up a whole new market for our 800 customers," said Michael Chaplo, market director of advanced 800 features for AT&T. "And 800 speech recognition saves our toll-free service [subscribers] money in a number of different ways."

Chaplo said the feature will save users money by reducing the need for operators who must field calls from rotary phone users, save on 800 usage charges by reducing the amount of time callers remain in queue, and reduce the number of times callers hang up while waiting for an operator.

The speech recognition device on which the feature is based is called the Automatic Speech Recognizer (ASR) and was devel-

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COMPAQ

SMC readies new suite of E-net hub products

By Skip MacAskill
Staff Writer

WASHINGTON, D.C. — Standard Microsystems Corp. (SMC) next week will expand its Ethernet support with a suite of new products for its work group and enterprise hub lines.

According to sources, SMC will roll out at INTEROP 93 Spring here a stackable Ethernet hub and new Ethernet modules for its Elite Switching (ES)/1 smart hub.

The highlight of the rollout will be the Elite 3812TP, a 14-port stackable 10Base-T Ethernet hub. It will support unshielded twisted-pair connections and offer two repeater channels, allowing an administrator to create two Ethernet segments.

As many as eight 3812TPs can be stacked together, supporting 112 end devices. The addition of one SMC Network Management Module (NMM) daughterboard to one of the hubs allows the stack to be managed via the Simple Network Management Protocol.

SMC will introduce several features that provide fault tolerance, including an optional redundant power supply, out-of-band management in the event of a line failure and support for a backup NMM within a stack of eight hubs.

The new hub will be available in June. Pricing was not yet set.

SMC will also roll out three Ethernet modules for the ES/1, each of which supports connection of four Ethernet local-area networks to the device's 800M bit/sec backplane and packet processing engine.

The new modules are the Quad Ethernet Fiber Module, which supports four fiber-optic connections; the Quad 10Base-T Module, which supports RJ-45 unshielded twisted-pair links; and the Quad Ethernet Coax Module, which has two BNC connectors for each of the four segments.

All modules are expected to be available in April. The fiber module will cost $4,600 and the 10Base-T and coaxial cable versions cost $3,950 each.

IDAPI spec shown in public for first time

continued from page 3

and driver developers of considerable programming work," said Betsy Burton, senior product manager for IDAPI at Borland in Scotts Valley, Calif.

The IDAPI architecture consists of an API, an object layer, a service layer, an SQL driver and database drivers (see graphic, page 3). This technology can run either as a client or server process.

The API consists of the SAG CLI for SQL programmers and the IDAPI Navigational CLI for programmers familiar with personal computer databases. These APIs allow programmers to access any type of database using the language with which they're most familiar.

The object layer is the core of IDAPI. It converts function calls to a common representation of data and then maps that data to methods or operations in database drivers. Specifically, the object layer determines the availability of databases and drivers, and dynamically loads drivers as needed; it checks the default settings for data formats, such as dates and numbers; it manages multiple sessions between clients and database servers; and it handles all errors returned by databases or drivers.

Below the object layer is the service layer, which handles all functions specific to the operating platforms of client applications and database servers. It also provides support for BLOB, in-memory tables and buffers.

Next are the database drivers, which generate and send calls to a target database. The SQL driver specifically translates navigational commands into SQL and emulates navigational functionality, such as scrolling cursors, bookmarks and buffering, for SQL databases.

Artisoft delivers upgraded LANtastic

continued from page 2

These are software packages that reside on clients of other networks and give LANtastic users access to files and services provided by other network operating systems, said Joe Waldigo, director of marketing at Artisoft, based here. For example, a bridged redirector residing on a NetWare client would give LANtastic users access to the NetWare server. The LANtastic users would have access to the same files and re-

sources as the NetWare client.

In addition to NetWare, LANtastic 5.0 supports redirectors for Unix Network File Systems. It also provides links to OS/2 and non-LANtastic drives, such as write once, read many times (WORM), facsimile and CDROM drives.

Other interconnectivity features in 5.0 include the ability to route Network Basic I/O System traffic using Novell's Internetwork Packet Exchange (IPX) as well as support for Microsoft Corp.'s Network Driver Interface Specification.

For the administrator, LANtastic 5.0 provides the ability to set up all network accounts from one server, as opposed to assigning rights from each machine, as was necessary before.

Other administrative enhancements include batch despooling — which lets the administrator send batch jobs to a designated LANtastic server after business hours, for example — and remote management capabilities. The latter allows an administrator to take control of a remote user's keyboard and screen.

LANtastic security has been enhanced to include file-level restrictions. The previous version was restricted only by drive and directory. Version 5.0 supports 12 levels of security, as opposed to the three or four provided by other peer offerings.

Finally, LANtastic has been enhanced to support delayed printing and remote printing, which lets all network print jobs be spooled on one server yet printed throughout the network.

LANtastic 5.0 is available now at $659 for the DOS starter kit, a hardware/software package for two users. The adapter-independent version starts at $119 for a single-user license.

Newbridge paints a VIVID net portrait

continued from page 1

mentations are tuned for more traditional LAN applications, he added.

The VIVID ATM hub is based on an eight-slot chassis with an overall switching capacity of 2.4G bit/sec. Each slot can house Ethernet, 4M and 16M bit/sec token ring, Fiber Distributed Data Interface, T-3 and ATM modules, each supporting one port. The ATM port can support local- and wide-area link speeds from 100M to 140M bit/sec.

The VIVID hub can connect to Newbridge's 36150 MainStreet wide-area ATM switch over T-3 and 140M bit/sec ATM links.

VIVID hub ports take in traffic from a VIVID LAN Service Unit (LSU). LSUs are combination work group concentrators and LAN bridges that connect to the hub's token-ring and Ethernet modules.

The Ethernet LSU supports as many as 24 10Base-T ports and forwards data at 10M bit/sec. The token-ring version supports a maximum of 16 4M or 16M bit/sec connections and links to the hub at either speed.

The VIVID ATM hubs and LSUs are priced from $350 to $600 per port. The ATM hub and Ethernet LSU are available now, and the token-ring LSU will be available in October.

VIVID Ridge

Newbridge also introduced an adaptation layer product, VIVID Ridge. The Ridge segments LAN frames into 53-byte ATM cells and forwards them to the VIVID ATM hub at 140M bit/sec. It also disassembles ATM packets and feeds them to LANs.

The Ridge lets LAN users forge dedicated connections between desktop machines at full LAN speeds, NeSmith said.

The Ethernet Ridge supports up to 12 Ethernet connections, while the token-ring version supports as many as eight 4M or 16M bit/sec connections.

Ethernet Ridges cost from $500 to $700 per port and are slated to ship in October. Token-ring Ridges cost $800 to $900 per port and will be available next February.

Newbridge is also rolling out four types of ATM network interfaces for workstations. The first, scheduled to be available in January 1994, is a software package for existing Ethernet and token-ring NICs from multiple vendors that supports ATM signaling, congestion control, segmentation and reassembly.

The other three support ATM links at speeds ranging from 51M to 622M bit/sec over unshielded twisted-pair, multimode and single-mode fiber cable, depending on the model. The adapters will roll out between March and May 1994 at prices ranging from $1,000 to $2,500.

To complete the line, Newbridge will offer a software-based router that works with its ATM equipment. The VIVID Route Server runs on a Sun Microsystems, Inc. SPARCstation or an Intel Corp. i486-based platform. It houses networkwide routing tables and supplies routing instructions to attached Ridges and hubs via a native 140M bit/sec ATM connection. The routers use the Open Shortest Path First proto-

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Feature supports rotary phones

continued from page 4

oped by AT&T Bell Laboratories for the carrier.

Chaplo said that during field tests conducted by the carrier, the ASR correctly identified spoken numbers 97.8% of the time. The ASR uses so-called "word-spotting," the ability to pick a number out of a spoken phrase or sentence.

AT&T plans to enhance the capabilities of the ASR to enable it to recognize more advanced words — it only understands "yes" and "no" today — and entire phrases. This will enable AT&T 800 customers to better process orders, dispatch repair crews and provide account information to callers.

Pricing for 800 Speech Recognition is identical to its push-button counterpart, called Call Prompter. Users will pay 5 cents per announcement and 6 cents per minute of announcement time. Companies will also pay $50 per month for each of the first five announcements, $30 for announcements six through 10, and $15 for announcement 11 and higher.

Rivals take aim at client/server

continued from page 1

graphical forms designer, report writer and query tool.

ViewPoint lets end users with no programming skills issue queries and create custom forms and reports by clicking on selected fields and icons. It joins tables in multiple databases and presents data in scrollable cursors.

ViewPoint is unique in that it has a tool for corporate developers, Informix-DBA, that lets them create customized subsets of the company database for individual users. These subsets — or SuperViews — take between 15 and 30 minutes to develop and can be employed by multiple users with the same needs.

"We are providing a tool that not only makes it easier for users to query complex corporate databases, but gives MIS a greater degree of control over database security and integrity," said Ronald Bower, marketing director at Informix in Menlo Park, Calif.

ViewPoint works with Informix databases, but, by year end, it will support other databases via standard interfaces. Informix also plans versions of ViewPoint for Macintoshes and Unix/Motif workstations by year end.

In addition to ViewPoint, Informix is announcing HyperScript Tools, which enables developers to build graphical applications for Windows, Unix and Macintosh computers. HyperScript Tools incorporates Informix's WingZ spreadsheet, business graphics, a debugger, and screen and menu painters, among other things. The initial release, due next month, will run on Windows, with other platforms to follow.

Oracle's vision

Not to be outdone, Oracle will make a big splash in two weeks when it unveils a family of 15 new and enhanced development tools it is calling the Cooperative Development Environment (CDE). CDE tools address the entire application development life cycle — from defining strategy and analyzing requirements to designing, building and implementing applications.

"Customers told us they want to develop simple and complex client/server applications using the same set of integrated tools," said Farzad Dibachi, product marketing director at Oracle in Redwood Shores, Calif.

Oracle will introduce two end-user tools — Oracle Book and Oracle Browser — as well as graphical versions of its fourth-generation language tools — Oracle Forms, Oracle Reports and Oracle Graphics. It also will announce Windows versions of five computer-aided software engineering (CASE) tools.

Oracle Browser is a graphical data access tool that lets users create SQL queries by clicking on selected items. Oracle Book incorporates a hypertext capability that lets users create and view online documents containing voice, data image and video elements.

Both of these tools are available now and support Windows, Macintosh, Unix/Motif and character-based user interfaces.

Oracle has enhanced its fourth-generation tools in several ways. First, it has ported the tools to Windows, Macintosh and Motif platforms, with future support planned for Hewlett-Packard Co.'s OpenLook, IBM's Presentation Manager and NeXT, Inc.'s NeXTSTEP.

Oracle has also incorporated into the tools an Adaptable User Interface Kit, which lets developers build an application on one platform and deploy it on others. The tools are also tightly integrated. A user working in Oracle Forms, for example, can generate graphics and reports using Oracle Graphics and Oracle Reports.

Tightly coupled with all these tools are Oracle's CASE tools, which will ship on Windows this summer. Applications generated from Oracle's CASE tools will look and function the same as applications developed using other Oracle development tools.

U.K. firm to deliver APPN code for OEMs

LONDON — SNA software developers at Data Connection, Ltd. today will announce the first non-IBM developed APPN Network Node software available for OEMs.

The company's new Systems Network Architecture Protocol-Advanced Peer-to-Peer Networking (SNAP-APPN) software can be licensed by vendors of communications products such as routers and added to their products. Until now, OEMs had to buy IBM APPN NN code from IBM for $400,000.

A version for end users is also on tap for later this year.

SNAP-APPN is portable software code that can run on a variety of equipment, from routers to personal computers, said John Palombo, director in charge of SNAP-APPN development at Data Connection, based here. The software's primary function is to implement APPN NN, but it can also be configured as End Node (EN) software.

APPN is made up of NNs and ENs. NNs are the brains, containing APPN routing tables and topology data. Attached ENs use NN services to send data to any remote APPN node. SNAP-APPN supports dependent 3270 and LU 6.2 sessions along with IBM's Common Programming Interface for Communications.

According to Palombo, Data Connection built its APPN NN implementation using publicly available descriptions of the technology.

"We've been saying all along this could be done if a vendor had the time and expertise to do it," said Jane Munn, director of network architectures at IBM. "We applaud what Data Connection is doing, and we will be working with them to assure compatibility."

The company said it has no firm contract with any other vendor yet, but expects to announce agreements soon, possibly at INTEROP 93 Spring next week. At that show, Data Connection is scheduled to participate with 12 other vendors in an IBM demonstration of APPN product interoperability.

The product will help propagate APPN, said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C. "I wouldn't guarantee any product was completely IBM APPN-compatible until IBM publishes the specification, but this product goes a long way toward helping the spread of APPN," he said.

A spokesman for Proteon, Inc. in Westborough, Mass., said, "With this product, vendors aren't forced to go to IBM."

An early version of the product is available now, but it will not be generally available until the second quarter. Pricing was not announced, but Palombo said it will be in the six-figure range and will vary widely depending on the implementation.

— Michael Cooney

IBM going multiprotocol

continued from page 1

work plan the hard sell," *NW*, Nov. 30, 1992).

It includes algorithms and mapping techniques that enable applications written to work with various underlying transport protocols, the first of which are Systems Network Architecture protocols and the Transmission Control Protocol/Internet Protocol. A key feature of the MPTN code is it can be added to existing IBM operating systems without requiring changes to applications.

IBM said it will announce the MPTN code for its OS/2 platform that it demonstrated at the ComNet '93 conference earlier this year. The MPTN OS/2 software acts as a gateway to let users run data from TCP/IP applications over SNA nets and vice versa.

The OS/2 MPTN implementation would also let OS/2 users running TCP/IP Sockets applications exchange data with TCP/IP Sockets applications on an IBM mainframe over an SNA net. IBM is also expected to announce MPTN code for its MVS mainframes that works with the OS/2 version.

Third-party software developers will also be on hand and will play a large role in the success or failure of MPTN. IBM reportedly has been feverishly pitching the MPTN specification to other third-party vendors and standards bodies with only minimal success.

Ki Research, Inc., InConnection, Inc. and at least two other firms are among the first third-party vendors that IBM will tap to provide MPTN applications, sources said. Ki Research is expected to announce an application that will let Digital Equipment Corp. DECnet-based applications ship data over an SNA net.

IBM is also expected to add extensions to its Common Programming Interface for Communications (CPI-C) that will enable CPI-C applications to work with TCP/IP transports. Applications written to CPI-C, IBM's high-level application program interface, now work only with SNA LU 6.2 sessions.

In the APPN arena, IBM is expected to announce that its specifications for carrying APPN data over TCP/IP Sockets interfaces will soon be available from the Internet Engineering Task Force (IETF).

A spokeswoman from the IETF said the APPN over TCP/IP Sockets specification is scheduled to be presented at the IETF meeting at the end of March in Columbus, Ohio.

Once presented, the specification should be published in draft form and later as a standard that anyone could use. Last October, IBM also said it would present its Data Link Switching (DLS) specification to the IETF in March, but that has not yet been scheduled, the spokeswoman said. DLS describes how SNA traffic is handled when routed over TCP/IP nets.

Newbridge paints portrait

continued from page 1

col to communicate routing instructions to one another.

Route Server allows users to configure virtual subnetworks with logical connections and then enforces those virtual connections by telling the Ridges how they should switch information, NeSmith said.

Offering switching control on a separate platform makes it easier to add performance improvements and enables Newbridge to use commercially available software for report generation, backup and other functions, he said.

"If it was on a card [in the hub], then we have to do new generations of the card in order to get those performance improvements," NeSmith said.

Pricing was not available for the Route Server, which will ship in January 1994.

Analysts said Newbridge's pricing should be a boost for the VIVID products. "They're doing this at a price point that's palatable," said Rosemary Cochran, a principal at Vertical Systems Group in Dedham, Mass. "It's down in a range where it's more attractive than the $5,000-per-port levels we see now."

Worth Noting

"You're hearing it from the top: My organization was created to help customers downsize, among other things. Yes, folks, the 'd' word — downsize."

Tom Furey
General manager
Client/server computing
IBM
White Plains, N.Y.

Data Packets

Digital Communications Associates, Inc. of Alpharetta, Ga., last week announced the IRMA Pocket 3270 Adapter and software that lets laptop, notebook or portable personal computers communicate with 3270 applications on an IBM mainframe.

IRMA Pocket works with DCA's IRMA Workstation for DOS 2.0 and will support DCA's Windows software later this spring.

IRMA Pocket is available for $695. Current IRMA, IRMA 2 or IRMA 3 Convertible adapters can upgrade to the IRMA Pocket for $395.

Tivoli Systems, Inc. of Austin, Texas, said 13 companies will provide software or consulting services for its object-oriented management environment.

Tivoli also said it formed a partners program whereby several of those vendors will develop distributed management applications for the Tivoli Management Environment.

The 13 vendors include Legent Corp., Sybase, Inc. and a number of smaller software houses.

Most applications will be available by the end of the third quarter, Tivoli said.

DEC mgmt. product targets users impatient for DME

Polycenter Framework offered as DME alternative.

By Jim Duffy
Senior Editor

MAYNARD, Mass. — Due to the lengthy development cycle for the OSF's DME, Digital Equipment Corp. is positioning its Polycenter Framework network and systems management product as an alternative to the distributed, multivendor management scheme.

DEC officials claim that Polycenter Framework conforms to the "spirit" of the Distributed Management Environment (DME) because it resembles the Open Software Foundation, Inc. (OSF) framework conceptually. Like DME, Polycenter Framework provides an object-oriented approach to developing management applications, supports multiple management protocols and includes reusable, generic management functions, DEC said.

According to Hartmut Streppel, a DEC DME consultant and member of the OSF DME evaluation team, DME applications will not appear until mid-1995. Therefore, "it's important for customers to know and start thinking about alternatives," Streppel said.

Though proffering Polycenter Framework as an alternative to DME, DEC maintains its earlier pledge to provide DME-compliant products within six months of DME availability. DEC has started implementing DME application program interfaces (API) into Polycenter Framework in prototype form and is planning to ship a DME software developers' kit by the end of this summer, Streppel said.

Because Polycenter technology was passed over by the OSF for inclusion in the DME, Polycenter Framework — formerly called DEC Management Control Center Director — has not attracted the support of management application developers and has suffered from a market perception of being DME-incompatible. As a result, DEC wants to position Polycenter Framework as close to DME as it can in terms of functional consistency and compatibility.

If DEC can convince software developers and users that Polycenter Framework is a functional equivalent to DME that will conform to the OSF specification over time, it will be a boost for DEC, observers said. So users will still have a DME-capable management environment should DME-compliant products fail to attract buyers, observers noted.

DEC has three internally developed methods to make Polycenter Framework functionally equivalent to OSF's DME.

The first is an interface that complies with the Object Manage-

(continued on page 11)

Controller offering ups X.25 access

By Michael Cooney
Senior Editor

WOODBRIDGE, Va. — Renex Corp. has announced a new communications controller that lets stand-alone and local-area network-based personal computers access multiple IBM mainframes or mid-range hosts over X.25 packet nets.

The RPad-2 is the first of the firm's new generation of protocol converters designed to let users send a combination of 3270, 5250 and ASCII traffic over X.25 wide-area nets.

The RPad-2 is an 80386-based controller designed to take the place of remote IBM 3174 or 5294 controllers. The box includes a packet assembler/disassembler that packages IBM 3270 and 5250 data into X.25 packets so it can traverse a public or private X.25 packet net to reach an IBM mainframe or Application System/400 host.

The product supports four wide-area ports at speeds up to 64K bit/sec each. Its 32 local ports can be used to support any mix of 3270 and 5250 terminals with as many as five host sessions each, as well as ASCII devices.

RPad-2s can also be equipped with a token-ring interface for attaching the device to host ma-

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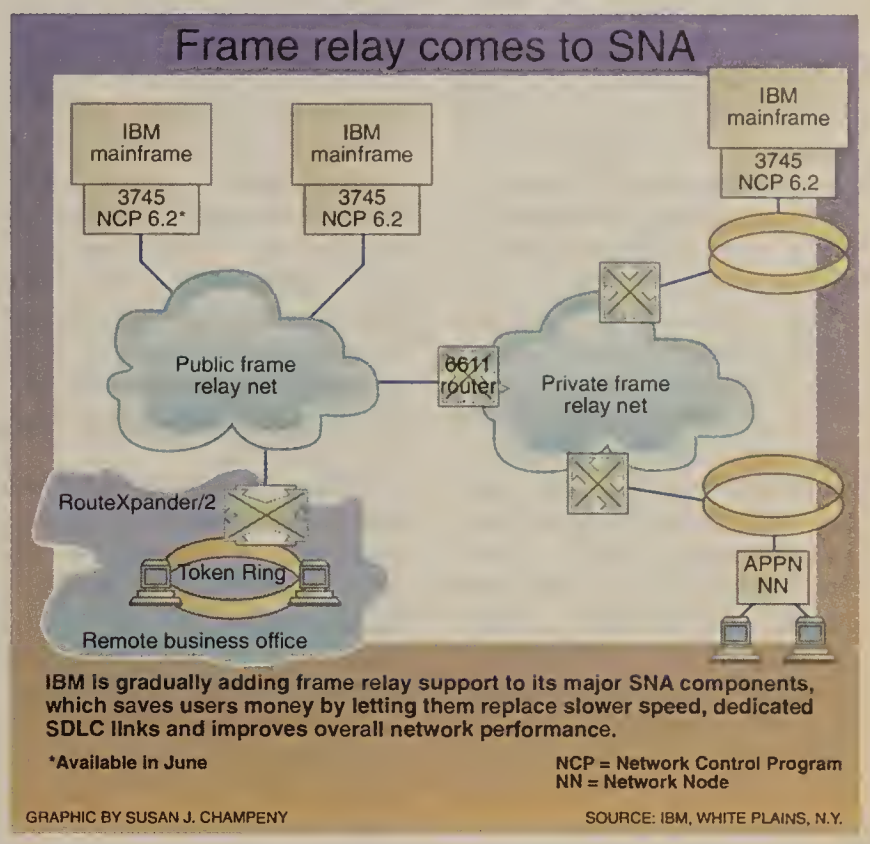

SNA camp wary of move to frame relay

Despite advantages and IBM's backing, many SNA users unwilling to brave new technology.

By Michael Cooney
Senior Editor

The road to frame relay may be the best path for SNA users to follow when evolving their networks, but for many users, the map has been difficult to read.

IBM has made frame relay the heir apparent to Synchronous Data Link Control lines for building wide-area Systems Network Architecture backbones. But by putting its weight behind frame relay, IBM is also instilling a modicum of fear, uncertainty and doubt into SNA users who historically distrust new technology.

"SNA users are so busy trying to figure out how to use [Advanced Peer-to-Peer Networking] or TCP/IP that the idea of moving to frame relay is a struggle they'd rather avoid," said Tom Nolle, president of CIMI Corp., a Voorhees, N.J., consultancy. "Even though frame relay has some obvious advantages for SNA users, no one has gone out of their way to make SNA users comfortable with it."

Why do it?

The single biggest reason for SNA users to explore frame relay is to cut line costs. By employing a frame relay backbone, analysts said SNA users could see an average of 35% savings over existing leased lines and a 30% improvement on backbone utilization.

IBM executives also pointed out that because it is implementing frame relay support in software on existing boxes, bringing frame relay to existing SNA nets should be as easy as a software upgrade.

IBM has added frame relay support to the 3745 with its Network Control Program Version 6 Release 2 and to its 6611 router. It has also added low-end Personal System/2-based branch office router software, the RouteXpander/2, which uses frame relay to bring local-area network traffic onto the SNA backbone.

The single biggest reason for SNA users to explore frame relay is to cut line costs.

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IBM has promised future frame relay support for its Application System/400, and RISC System/6000. The venerable

(continued on page 11)

NetLabs object-oriented mgmt. products unveiled

By Jim Duffy
Senior Editor

LOS ALTOS, Calif. — NetLabs, Inc. last week unveiled a new framework and products for an object-oriented management system that governs systems and network devices in a distributed computing environment.

The products, which manage multivendor devices in Transmission Control Protocol/Internet Protocol, Open Systems Interconnection and proprietary networks, will replace the firm's current NetLabs/Manager net and systems management product line. The new framework will augment the products' eventual migration to the Open Software Foundation, Inc.'s (OSF) Distributed Management Environment (DME) and allow users to port management applications to other management systems.

NetLabs/Manager provides only centralized management of systems and networks, and requires management applications to run on the same processor as the core management platform. Also, NetLabs/Manager is not an object-oriented system, which makes it more difficult to develop and alter applications.

The new products — NetLabs/Overlord Manager and NetLabs/Overlord Manager Development Environment — include a core set of management services and programming interfaces that enable users and vendors to develop applications that control various systems and devices using their protocol of choice.

"Management solutions have to do better at matching the way customers are organized to do management," said Carole Crall, NetLabs product manager. Because it can be configured as a distributed or hierarchical system, Overlord Manager allows users to move the management solution as their needs or organizational structures change.

Overlord Manager runs on Sun Microsystems, Inc. SPARCstations. It contains the same rules-based alarm triggering mechanism, called NerveCenter, that exists in NetLabs' current NetLabs/Manager product line, in addition to various new management services.

NerveCenter uses color codes to display varying user-defined degrees of event severity on the Overlord Manager graphical user interface (GUI). It can also initiate user-defined responses to error conditions, including sending an electronic mail message, dialing a pager number, automatically starting corrective actions by launching applications and displaying instructive text for users.

Overlord Manager's services are responsible for passing messages between objects — which are developed with the Overlord Manager Development Environment — and between objects and applications to remedy an error condition. The objects contain information on network devices as well as routines for accessing and managing those devices.

The services include event management, which reports and logs network events and Simple Network Management Protocol traps, and transaction monitor, which ensures data integrity.

An object manager service maintains objects' attributes and behavior, including their relationship to each other, while a data manager service employs a variety of methods for storing object information.

Another service, poll and transaction manager, provides message routing between objects and between objects and applications. A common network model service provides information on the managed environment topology for display on the Overlord Manager GUI.

NetLabs said Overlord Manager services will be ported to other platforms — such as Hewlett-Packard Co.'s OpenView, Sun's SunNet Manager and the OSF DME — over the next year to allow those systems to run Overlord applications.

Analysts are impressed with Overlord Manager but said it will need to attract application developers. "I think they put together the right kind of technology to solve the kinds of problems people have," said John McConnell, vice president of Infonetics Research Institute, Inc. in Boulder, Colo. "Now the key is [whether] they can get the right kind of application portfolio on top of that technology."

That's where the Overlord Manager Development Environment fits in. It allows users and third-party developers to build distributed management objects and applications that work with Overlord Manager.

The development environment includes the Overlord Manager, an object tool kit and application program interfaces (API).

The object tool kit includes an object editor/browser, which allows developers to view and modify objects and their relationship to each other. It includes a Management Information Base (MIB) Parser, which enables developers to add SNMP MIB definitions to applications, and an OSI Guideline for the Definition of Managed Objects Parser, which allows developers to alter definitions of existing objects.

The development environment contains nine APIs, including a transport protocol-independent API, a management protocol API, an object method API for defining objects and the X/Open Company, Ltd. Management Protocol API, which provides applications access to SNMP and the Common Management Information Protocol.

The Overlord Manager costs $15,000 for a single user and will be available in the second half of the year. The Overlord Manager Development Environment costs $25,000 and will be available in the second quarter.

SNA camp wary of frame relay

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3174 controller may also receive a frame relay interface down the road.

IBM said frame relay and APPN technology complement each other because frame relay can provide nondisruptive rerouting for APPN-based SNA sessions.

"Frame relay can do for routers and gateways what LANs have done for workstations: provide a free-for-all of connectivity," said Ellen Hancock, IBM's Networking Systems vice president and general manager, at an October meeting of the Frame Relay Forum. "The larger the network and the more complex the topology, the greater savings frame relay can offer."

Nolle said frame relay is well suited for those SNA users that are bringing LANs onto the backbone because frame relay can handle bursty LAN traffic by supplying large amounts of bandwidth on demand.

"SNA users would be able to multiplex multiple protocols without having to worry about encapsulating or tunneling," he said. "SDLC can't do that."

Despite all the benefits frame relay can bring SNA, users have been slow to embrace it.

"From what we've seen, frame relay [service] is still too expensive for us," said James Frost, manager of operations for Western Resources, Inc., a utility firm based in Topeka, Kan., that has multiple T-1 lines to remote token-ring LANs throughout Kansas. "Our current networking needs don't justify it."

According to three research firms — Dataquest in San Jose, Calif., Vertical Systems Group in Dedham, Mass., and Forrester Research, Inc. in Cambridge, Mass. — overall user demand for frame relay services is down. All three firms blame that situation mostly on the carriers, which have touted frame relay as the network cure-all for the past few years but failed to deliver on those promises.

"Frame relay has always been looked upon as a technology looking for a problem to solve," said Anura Guruge, an independent consultant based in New Ipswich, N.H. "[IBM and others] have not adequately demonstrated the economics of using frame relay to the SNA user."

DEC targets impatient users

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ment Group's (OMG) Common Object Request Broker Architecture (CORBA). The CORBA API allows applications to request the services of an object request broker, which pulls together objects distributed in a network to accomplish a specific task. DEC submitted object technology to the OMG to help define the CORBA specification and is currently shipping software that contains the CORBA API.

In the context of DME, the CORBA API will allow access to DME object management services, such as requesting and pulling together objects involved in the management of a network system or device, said Gail Ferreira, DEC DME program manager and Polycenter Framework business manager.

The OSF has pledged to support CORBA in DME, but the Polycenter Framework could include the CORBA API before the DME framework is released in December, Ferreira said. DEC is running a prototype of the Polycenter Framework with the API in its labs now, she said.

Another DME compatibility feature is an Access Module that allows Polycenter Framework to manage DME agents. Access Modules are interfaces into the Polycenter Framework from other management environments.

A DME Access Module will allow the non-DME-compliant Polycenter Framework to support DME's manager-to-manager protocol, enabling the DEC system to manage DME objects as if they were Polycenter objects, Ferreira said. DEC does not prefer this method, however, because the company plans to comply with the DME, she said.

The third method is DEC's Polycenter Common Agent. The Common Agent provides a consistent set of agent services for systems and applications so they can be remotely managed by any Systems Network Management Protocol or Common Management Information Protocol management system, including DME-compliant systems ("DEC unwraps agent pack for distributed management," *NW,* Nov. 16, 1992).

Controller ups X.25 access

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chines at central locations.

The company's previous controller, the 80286-based RPad-1, could only support half as many devices, at slower speeds, as the RPad-2 and did not support LAN-attached devices.

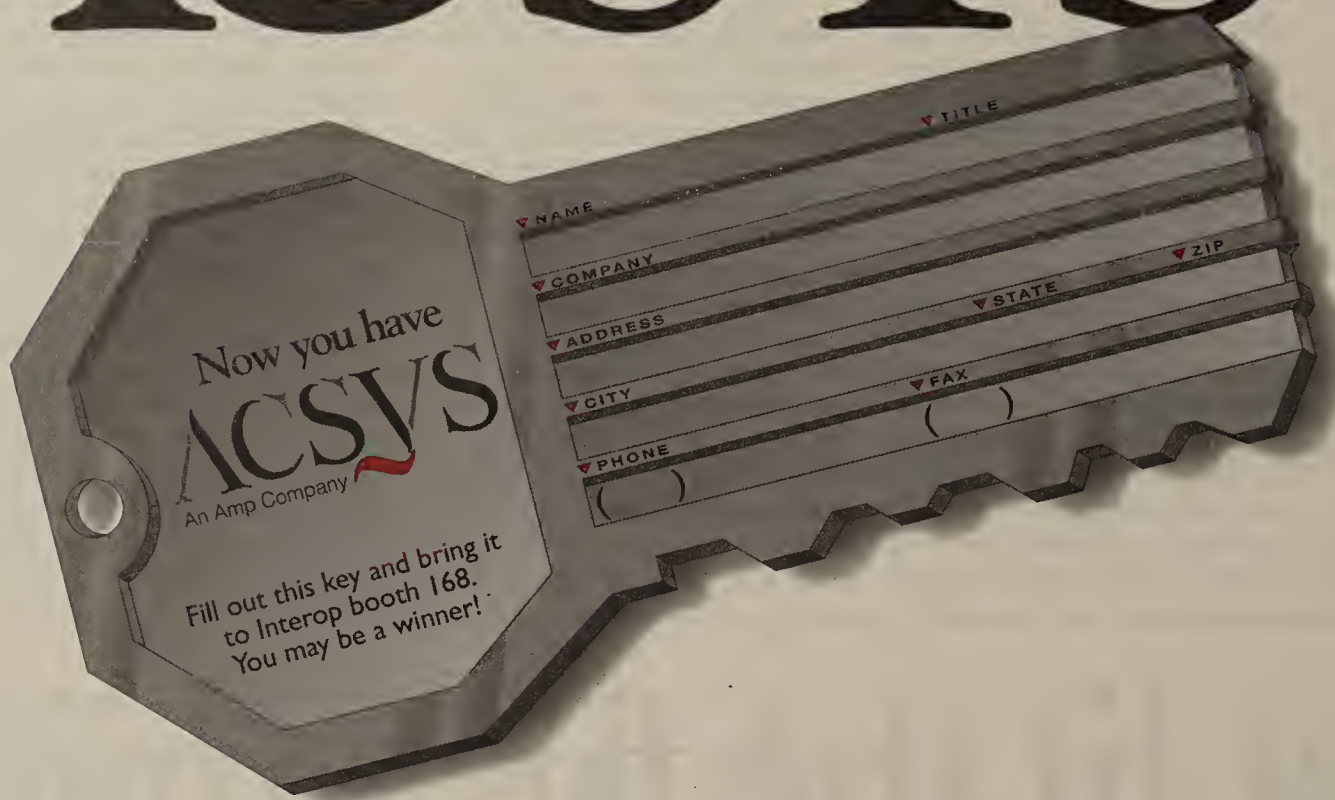
Elizabeth Schwartz, director of Renex corporate marketing, said that while the RPad-2 is a replacement product for remote IBM controllers, it competes more closely with low-end controllers from Andrew Corp. and Telepartner International.

"The primary difference between the RPad-2 and the competition is that we support simultaneous 3270 and 5250 transmissions and the others require separate controllers for each," Schwartz said.

She added that the company has big plans for the RPad-2 technology, including support for frame relay, Integrated Services Digital Network and T-1 wide-area links, and asynchronous PAD and host connection functions.

The RPad-2 is available for $10,000. The token-ring interface costs $1,495.

GAIN ACSYS!



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Worth Noting

"I don't worry about a graphical user interface. Desktops have GUIs, and we're not in that business."

Robert Young
Director of NetWare products marketing
NetWare Systems Group
Novell, Inc.

Netnotes

Xylogics, Inc. last week announced a new Reverse LAT protocol feature for its Annex communications servers that lets users of Digital Equipment Corp. VAX minicomputers access and share peripherals. Earlier Annex implementations of the Local Area Transport protocol enabled only one-way communications, letting Annex users access VAX machines. Reversing the process lets VAX users access net resources attached to Annex communications servers.

Xylogics, based in Burlington, Mass., also introduced a new network security feature for its networks. The unique audit trail feature lets net administrators record all transactions between LAT users.

The option, including the LAT and audit trail capabilities, is available immediately for Annex software Release 7. The option costs $160 for an eight-port Annex server, $320 for a 16-port Annex and $1,280 for a 64-port communications server.

To give Macintosh PowerBook users links to corporate local-area networks, Burlington, Mass.-based **Shiva Corp.** will bundle Apple Computer, Inc.'s AppleTalk Remote Access (ARA) client software with its own LanRover/L and LanRover/E software for ARA remote networking servers. The combination will allow PowerBook and Macintosh

(continued on page 23)

Network General to give DSS artificial intelligence

But analysts question how much it will help users.

By Caryn Gillooly
Senior Editor

WASHINGTON, D.C. — Network General Corp. next week is expected to announce that it is adding the artificial intelligence found in its Expert Sniffer network analyzer to its Distributed Sniffer System (DSS).

The hardware/software DSS product consists of what the company calls servers — which are basically analyzers that reside on each network segment — as well as a central console that collects information from each of the servers distributed throughout the network.

With these new capabilities, the DSS administrator will be able to use AI to help solve problems on remote networks that might otherwise have required an on-site visit. Currently, AI is available only on the company's Expert Sniffer, which is a stand-alone network analyzer.

At the INTEROP 93 Spring show here, Network General of Mountain View, Calif., is also expected to map out future product directions for its DSS line. They include adding support for the Simple Network Management Protocol Remote Monitoring Management Information Base and integrating DSS with other companies' network management systems, according to sources close to Network General. Further details were not available.

Analyst skepticism

Analysts said Network General is moving in the right direction by distributing Expert Sniffer capabilities, but most said the company would have to improve the AI capabilities before they would be truly useful to DSS users.

"The point of the Expert Sniffer was to make life easier [for administrators], but it's too inflexible," said Todd Dagres, an analyst at The Yankee Group, a Boston-based research and consulting firm. "The Expert Sniffer provides tools that Network General thinks are important, but you can't customize it" to add capa-

(continued on page 23)

University develops new multimedia LAN scheme

By Joanne Cummings
Senior Writer

KANSAS CITY, Mo. — Users looking to implement real-time video and multimedia applications over LANs may get some help in the near future.

The Center for Telecomputing Research (CTR) at the University of Missouri here has developed a local-area network, the Local Multimedia Network (LMN), that works over a traditional Ethernet bus topology but ensures bandwidth on demand and real-time data delivery by obviating the need for Ethernet's Carrier Sense Multiple Access with Collision Detection signaling scheme.

LMN, which runs at speeds up to 50M bit/sec over traditional copper wiring and up to 150M bit/sec over fiber, uses a 53-byte packet, enabling it to integrate with future Asynchronous Transfer Mode network implementations, according to Upkar Varshney, a research associate at CTR.

"Using [LMN], there will be no need for translation or bridging, so there will be no delay going into the wide area," he said.

In the LMN scheme, one LAN

"Using [LMN], there will be no need for translation or bridging," Varshney said.

▲▲▲

station acts as a system monitor, controlling access to the LAN. The monitor sends control packets that track LAN utilization across the net every 6 msec.

When a workstation needs to

(continued on page 23)

New remote access products

Vendor	Product	Capability	Price	Availability
Telebit Corp.	NetBlazer PN	Remote LAN access via IP, IPX and AppleTalk protocols; branch office connectivity via leased lines or analog or digital dial-up connections	$2,295-$2,695	2nd quarter
DigiBoard, Inc.	PC IMAC	Remote Ethernet access via ISDN lines	$995	Immediate
Traveling Software, Inc.	LapLink V	Remote and network-based file-transfer and disk management	$169	Immediate
	LapLink V for NetWare	Same as LapLink V but does not include cables	$99	Early 2nd quarter

Vendors offer remote connectivity options

Streams of remote connectivity products make it easier for users to stay on-line on the road.

By Fredric Paul
Senior Editor

SUNNYVALE, Calif.— Telebit Corp. led a parade of remote connectivity announcements last week, introducing a communications server designed to enable remote access to LANs as well as dial-up and leased connections between LANs.

Also last week, Traveling Software, Inc. introduced LapLink V, which offers file transfer to remote clients and across local-area networks. And in a similar vein, DigiBoard, a division of Digi International, Inc., this week is expected to announce its PC IMAC, which uses Integrated Services Digital Networks to link remote personal computers with Ethernet LANs.

While the products focus on slightly different markets, they all address the growing need to give remote users better access to LAN resources.

A dedicated device attached to the LAN, Telebit's new NetBlazer PN is designed to handle several remote connectivity functions. Like competing products, NetBlazer PN allows remote clients to dial into a branch office LAN using Internet Protocol, Internetwork Packet Exchange (IPX) or AppleTalk protocols. Users dial directly into NetBlazer PN and then work as if they were a local node on the LAN, according to Paul Singh, Telebit's director of product marketing.

But NetBlazer PN can also route traffic between branch LANs and a central network via leased or dial-up lines, including ISDN links.

Controlled with a Windows-based graphic interface, NetBlazer PN supports the Point-to-Point Protocol, enabling it to work with a variety of routers at a user's central site.

According to Singh, the briefcase-sized NetBlazer PN comes in two models, both of which will ship early in the second quarter of 1993. Both models support Ethernet connections over 10-Base-T, 10Base5 or 10Base2 media, and have a synchronous port that supports transmission speeds of 56/64K bit/sec over leased lines or ISDN Basic Rate Interface.

Prices range from $2,295 for the NetBlazer PN2, which needs an external modem, to $2,695 for the NetBlazer PN1, which has a built-in V32.bis modem.

LapLink goes LAN

Traveling Software has extended its popular LapLink file-transfer program to Novell, Inc. NetWare networks.

LapLink V supports peer-to-peer file transfers via NetWare connections and lets dial-up users connect to other machines on a NetWare LAN.

When a user logs onto LapLink under NetWare, the program shows all the other machines on the network running LapLink and enables users to find the appropriate remote machine using Novell's Service Advisory Protocol. Running over an Ethernet network in the NetWare environment, LapLink V can transfer files at up to 8M bytes a minute.

Dial-up users can now connect to any PC on the LAN and have access to that machine's drives and

(continued on page 23)

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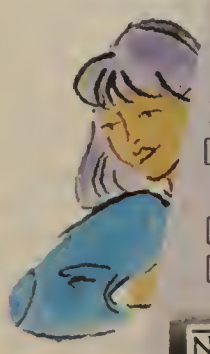

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INTERNETWORKS

LAN-TO-LAN AND LAN-TO-WAN EQUIPMENT AND STRATEGIES

Worth Noting

"The day users can have a truly multivendor, completely interoperable router-based internet is light-years away."

Vic Forgetta
General manager
Netronix, Inc.
Petaluma, Calif.

Link Notes

CrossComm Corp. last week announced packet filtering software for its ILAN router that will improve net access security and provide more control over bandwidth consumption. The SmartFilter helps prevent unauthorized users from accessing certain data, such as net management applications. It also helps optimize bandwidth use by limiting the types of data some users are authorized to ship across the net.

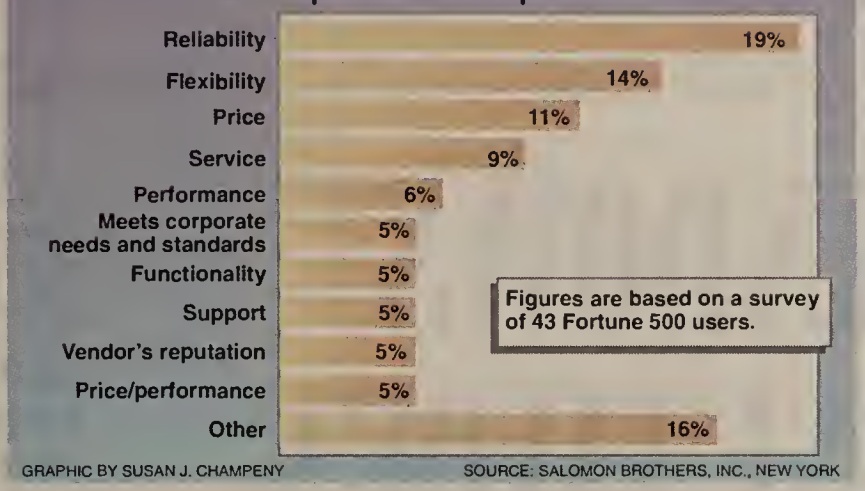
The software, when used in conjunction with the vendor's traffic prioritization software ("CrossComm gives SNA a high priority, *NW*, Aug. 31, 1992), further allows users to prioritize traffic over wide-area links according to user-defined parameters.

SmartFilter is available now in Release 5.04 as a free software upgrade.

Microcom, Inc. has announced that its multiprotocol Microcom Bridge/Router (MBR)/6500 has successfully completed frame relay compatibility tests separately staged by AT&T, Northern Telecom, Inc., Nynex Corp., Sprint Corp. and WilTel. The MBR/6500 is designed to connect small to midsize local-area networks via frame relay and X.25. For more information, contact Microcom at (617) 551-1000.

Users dependent on dependable routers

The most important criteria when considering a multiprotocol router purchase



GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: SALOMON BROTHERS, INC., NEW YORK

INTERNETWORKING MONITOR

BY SCOTT BRADNER

You've lost if you must ask 'What application?'

A few years ago, Harvard University participated in a metropolitan-area network trial with the local telephone company.

This was quite a nice service, offering Ethernet-speed local-area network connections between four Boston and Cambridge, Mass., sites. Before the trial started, we had a few, somewhat slower connections — 2,400 to 9.6K bit/sec — between most of the sites, but the increase to 10M bit/sec made quite a difference.

Before and during the trial, the vendor sent up survey teams to ascertain which applications we were running over the test network. While we were using dozens of network-based applications — with the potential for hundreds — there were few, if any, additional applications enabled because of the higher speed pathways. Things simply took less time.

The survey teams could not understand that and kept asking us to tell them which two or three applications could be used to justify a metropolitan-area network service offering.

I'm telling this story in light of congressional hearings a few weeks ago at which speakers urged telecommunications vendors to provide the service that would be the foundation of a national data network infrastructure.

I'm not sure the time for that is here yet. The telecommunications industry is beginning to get a feel for what is involved in providing an interorganizational data network. Unfortunately, there are still some gaps in their understanding.

The telecommunications providers are focused largely on intraorganizational services. Consider, for example, one of the more widely used services today, virtual private networks (VPN).

VPNs are a way for many branches of an organization to be connected, but they are not pooled like the telephone system, where one phone connects a person to another phone. Buying network connections with VPNs is like purchasing a telephone service that allows you to talk to your branch office in New York but not to a business next door.

One doesn't build an infrastructure by keeping the pile of

(continued on page 16)

Asante adds bridge, hub to E-net offering

The firm's product expansion rollout reinforces its promise to focus on departmental LANs.

By Skip MacAskill
Staff Writer

SAN JOSE, Calif. — Asante Technologies, Inc. this week will expand its Ethernet capabilities when it rolls out a new intelligent hub, an Ethernet bridge module for its existing work group hub and an upgraded net management package.

The new AsanteHub 2072 is a seven-slot Ethernet hub designed for departmental local-area networks and supports as many as 72 end nodes. The device features two 10M bit/sec backplanes, allowing a net manager to assign modules to one of two Ethernet segments via a switch on the module's front panel.

The company is offering a range of hot-swappable interface modules, including 12- and 24-port 10Base-T modules that support either RJ-45 or RJ-21 connectors, as well as a 10-port 10Base2 module and six- or 12-port 10Base-F fiber modules.

The 2072 also supports a three-port Reduced Instruction Set Computing (RISC)-based Ethernet bridge module that can be used to link the backplanes in the hub, bridge segments in different Asante hubs or link a segment to a wide-area net.

Based on Fujitsu America, Inc.'s SPARClite RISC Processor, the module supports the Spanning Tree Algorithm and can filter and forward 64-byte packets at a rate of 14,800 packet/sec.

The hub has flash erasable programmable read-only memory, which maintains the hub's configuration in the event of a power failure and allows the net manager to download new software from a central location. An optional redundant power supply is also available.

The hub supports the Simple Network Management Protocol and AMS Link, Asante's out-of-band management feature that allows users to manage as many as 12 Asante hubs simultaneously through a single modem.

"It's our belief that the user

(continued on page 16)

Hadax adds management, beacon detection to hubs

By Skip MacAskill
Staff Writer

WASHINGTON, D.C. — Joining the trend to provide users with stackable hub options for work group environments, Hadax Electronics, Inc. next week at INTEROP 93 Spring here will roll out a multiport token-ring hub.

Billed as an advanced intelligent multistation access unit (MAU) by the company, the RingTamer 110 is the newest addition to Hadax' RingTamer Series 100 line of hubs and MAUs, offering support for the Simple Network Management Protocol and advanced token-ring features, such as beacon detection.

The 110 is an eight-port device that operates at either 4M or 16M bit/sec. It also has a ring-in/ring-out port that can be used to daisy-chain as many as 256 RingTamers. A 16-port version is planned for later this year.

The device features a beaconing in/out (BIO) capability that automatically recognizes when an end node begins beaconing due to a hard error, such as a cable fault or network interface card malfunction. BIO will automatically disable the beaconing port and reportedly alert the network manager within one second, reducing network downtime.

The 110 also features a speed in/out (SIO) function that will automatically check the speed of an end node being attached to the network. If the device does not support the speed of the network, SIO will not allow the end node to access the ring, thereby preventing a potential network crash.

Both the BIO and SIO features will work even if there is not a

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You've lost if you ask 'What application?'

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parts separate.

Compare that model to the so-called mid-level networks, such as Alternet, BARnet, the New England Academic and Research Network (NEARNET), the Performance Systems International, Inc. Network and others that make up the bulk of the U.S. portion of the Internet. Whatever true infrastructure exists in this country is mostly due to these mid-levels, which connect thousands of organizations.

Most of these networks are not intended just for woolly academicians and paid for by the federal government. The NEARNET (yes, I have a bias since I was one of its founders) started without National Science Foundation funds and is totally self-supporting. More than two-thirds of its membership is commercial organizations.

It may seem a bit silly that these networks purchase their communications links from a local telephone company, stick modems on the end and then resell the links to their customers. It seems that if the middleman — the mid-level network — was eliminated, the telephone companies could sell the connectivity service directly.

Most of the mid-level networks' problems, however, are not those of broken phone lines but rather those problems that fall under the umbrella of user services and problem resolution.

Helping users configure their environments to make use of, and protect themselves from, the Internet is not an easy task. Telecommunications vendors do not understand that this is a required part of an infrastructure offering.

It is reasonable to expect that the time will come when true interconnectivity and useful user support will be offered by the telecommunications vendors. Until then, it is important that the creation of a national data infrastructure be done using the existing mid-level networks and under strong guidance from the federal government. This will remain the case until the telecommunications vendors stop looking for the "killer application" and realize it has been here all along — it's called connectivity.

Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

Asante adds bridge, hub to E-net offering

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shouldn't have to trade off enterprise functionality for the ease of rack-and-stack," said Craig Johnson, director of product marketing at Asante. "With the 2072's functionality and $83-per-port cost, the user isn't forced to do that."

The 2072 will be available in May for $1,095. The host modules will cost between $725 and $2,845, depending on the Ethernet type and ports supported.

The bridge module, which can be configured with one or two Ethernet interfaces and a WAN or external Ethernet interface, costs between $2,495 and $2,995, depending on configuration. It will be available in the third quarter.

Asante also introduced bridging capabilities for its 12-port AsanteHub 1012 work group hub. The new RISC-based AsanteBridge 1012 fits into the AsanteHub 1012's expansion slot and bridges Ethernet traffic between that device and another Asante hub.

Also based on Fujitsu's SPARClite processor, AsanteBridge forwards and filters 64-byte packets at 14,800 packet/sec and supports the Spanning Tree Algorithm.

The bridge module also supports SNMP capabilities, making it a value-added replacement for the SNMP Management Module that currently fits into the expansion slot.

AsanteHub 1012 and AsanteBridge, which will be available in May, cost $3,099 when purchased together. Current users of the SNMP Management Module can upgrade to the bridge version for $1,999.

In order to manage the new additions to its Ethernet line, Asante will roll out Version 2.2 of its AsanteView net management software package, which offers four new management applications.

Find Talker and Find Node work in tandem to pinpoint network problems. Find Talker automatically searches the net for nodes sending corrupted or large numbers of packets. Find Node then discovers which hub and port support the node.

Database Logging automatically logs as many as 16 performance statistics, and Bridge Management allows net managers to configure bridge parameters for the AsanteBridge 1012.

Available in May, AsanteView 2.2 will be offered as a free upgrade to existing 2.1 users.

Worth Noting

The worldwide market for fiber-optic cable and equipment will climb from $4.34 billion last year to $14.3 billion by 1998, largely due to deployment of fiber in the local loop in Germany, Japan, the U.K. and the U.S., according to a recent report by Kessler Marketing Intelligence, Inc., a Newport, R.I., research and consulting firm.

Regulatory Update

Officials of China's State Planning Commission last week agreed to discuss the purchase of an array of **AT&T** equipment to modernize its telecommunications infrastructure.

The proposed cooperative agreement includes the sale of AT&T Network Systems 5ESS central office switches and AT&T microelectronics, net management offerings and optical transmission systems.

The proposal also includes the sale of wireless communications systems, customer premises equipment, training programs, systems integration services and network service offerings.

An AT&T spokeswoman said the proposed agreement is expected "to boost sales of equipment and services to China to the multibillion-dollar level in the next decade."

The proposal calls for the establishment of a 5ESS switch manufacturing venture in China, subject to U.S. government approval. AT&T would also transfer microelectronics technologies related to switch manufacturing and design.

Far-reaching Ameritech reorganization in the works

The RBHC also outlines ATM net service plans.

By Ellen Messmer
Senior Correspondent

CHICAGO — Ameritech is planning to reshape its five local exchange carriers to better meet the needs of business and residential customers.

The reorganization will involve dropping the individual Bell company name tag of each local exchange carrier in favor of the common moniker, Ameritech, which will appear on future customer bills. In addition, by 1994, Ameritech will phase in 12 marketing groups targeted at serving customers' specific interests, such as cellular or small businesses, across its entire Midwest region.

In a separate development last week, Ameritech issued a request for proposal for Asynchronous Transfer Mode (ATM) switches that will enable the company to begin offering ATM-based net services.

Ameritech's organizational changes are supposed to help the companies better respond to customer needs, said William Weiss, Ameritech's chairman and chief executive officer. The units expected to be in place by next year are: Ameritech Consumer Services, Ameritech Small Business Services, Ameritech Enhanced Business Services, Ameritech Custom Business Services, Ameritech Long-distance Services, Ameritech Information Industry Services, Ameritech Telephone Industry Services, Ameritech Pay Phone Services, Ameritech Advertising Services, Ameritech Cellular Services, Ameritech Leasing Services and Ameritech Network Services.

Eleven of the units are intended to serve specific customer segments, while the other, Ameri-

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MCI tries to one-up AT&T with 800 service guarantee

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — MCI Communications Corp. last week tried to one-up AT&T on the reliability of its 800 service by rolling out a five-minute service restoral guarantee.

The new offering, dubbed 800 Guardian, guarantees to restore 800 service within five minutes of an outage or credit customers for one month's worth of fixed charges. MCI said its offer is good whether the problem that knocks out service is traced to its own network or to a local carrier.

MCI will restore a customer's 800 service by routing the traffic to an alternate location predesignated by the user. If the customer does not have a specified alternate location, traffic will be routed to a recording.

AT&T rolled out a similar five-minute restoral guarantee in January. Both carriers previously offered a 15-minute service restoral for 800 traffic.

After MCI's announcement last week, the two carriers traded barbs over which one is leading the way in 800 reliability. AT&T accused MCI of making several false statements about AT&T's guarantee program.

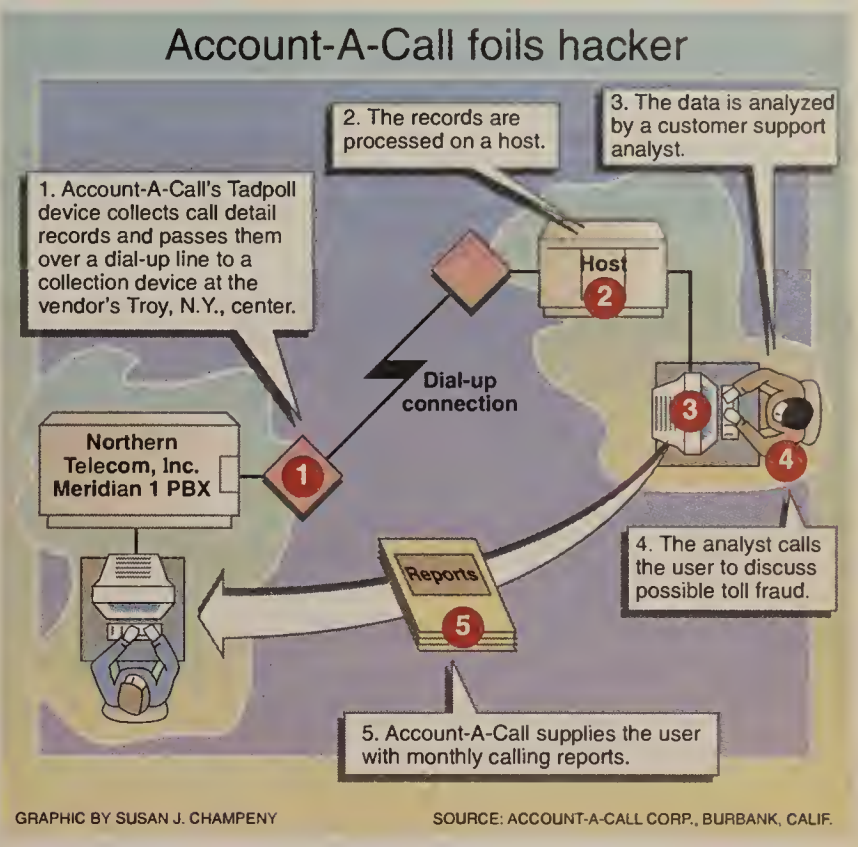
The main bone of contention is the scope of outages covered by the guarantees. MCI said its plan will cover customers regardless of whether the outage is on MCI's or a local carrier's network and whether it is a switch, software or power failure.

"We know our customers don't want to hear 'That's not our problem,' " said Scott Ross, MCI vice president of marketing.

MCI claims that AT&T's guarantee covers only outages on AT&T's network and does not cover network-related systems such as power supplies.

AT&T, however, strongly denounced MCI's claims. The carrier said it covers all customers for all outages. AT&T also said its offering actually exceeds MCI's guarantee because it will cover 800 usage and not just monthly fixed charges if the problem is traced to AT&T's network.

MCI's and AT&T's guarantees are free of charge.



Monitoring service thwarts toll hacker

Account-A-Call helps Shiva capture a hacker masquerading as a phone company technician.

By Bob Wallace
Senior Editor

CAMBRIDGE, Mass. — Shiva Corp. last week detailed how its use of a toll fraud monitoring service helped it stop a hacker before its losses got out of control.

As is the case with a growing number of companies, modem and router vendor Shiva fell prey to a hacker masquerading as a trusted business partner — in this case, a New England Telephone and Telegraph Co. technician.

When the hacker was identified, he was already behind bars as a convict in a Boston-area prison. Neither party would say if the hacker was punished for the crime.

It started innocently enough.

Late last year, a caller claiming to be a New England Telephone technician telephoned Drew Deskur, Shiva's telecommunications manager, and said he would be performing trunk testing on the firm's lines.

Thinking it was a reasonable request from a trusted vendor, Deskur told the attendant that runs the company's Northern Telecom, Inc. Meridian 1 private branch exchange to expect the calls.

The technician told the operator that the calls would appear on the firm's telephone bill as collect calls but that the company would not be charged for them.

The hacker began to use the Shiva switch for fraudulent calling without realizing that the company was paying Account-A-Call Corp., a toll fraud monitoring service provider, to collect and analyze calling data.

With the Account-A-Call service, the user leases a small stand-alone device, called a Tadpoll, that is locally linked to a PBX's station message detail recording (SMDR) port. The device collects call detail data from the switch.

Account-A-Call polls the device and passes the call detail data to a host, which processes it. Specialists examine the data for any signs of toll fraud, alert users to unusual calling patterns and produce supporting reports.

Just a few days after the fraudulent calls began, a customer support analyst with Account-A-Call noted a curious pattern of direct trunk access 800 calls, trunk numbers in extension fields and long-duration calls.

Direct trunk access 800 calls are calls in which a person dials an 800 number to reach a firm's PBX and gains access to — or has an attendant secure — a switch

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Reorganization at Ameritech in works

continued from page 17

tech network services, will provide the products and services offered by all the Ameritech business units and operate the Ameritech network.

At last week's press conference, Weiss also declared that Ameritech is willing to grant competitors greater access to the local loop in return for permission to enter the long-distance business, an area off-limits to the regional Bell holding companies. Ameritech also wants freedom from the current price cap regulation.

According to Thomas Hester, Ameritech executive vice president and general counsel, the company plans to file a proposal called Customers First: The Ameritech Advanced Universal Access Plan with the Federal Communications Commission detailing the concessions Ameritech is willing to make in exchange for the freedom to offer long-distance service.

The FCC alone cannot lift the ban, but Ameritech is hoping that the FCC's backing would galvanize other authorities.

Hester said Ameritech's proposal would let competitors collocate switches in the RBHC's offices and directly connect to the Ameritech local loop in order to provide public switched services to customers. This goes beyond anything comparable in physical or virtual collocation available today.

When asked whether Ameritech would still have a home field advantage, Weiss said industry giants such as Time-Warner, Inc., IBM and AT&T would emerge as competition in the local loop. "It will be a fair fight," he said.

But Ameritech's willingness to accommodate competitors remains an open question. In mid-February, Ameritech filed a petition with the FCC asking for an exemption from the agency's order last October requiring the seven RBHCs to physically collocate competitors' equipment.

The FCC's order, Expanded Interconnection with Local Telephone, is designed to promote competition in the local loop. Ameritech is asking for an exemption from the physical collocation requirement at 18 central offices in Indiana, Ohio and Wisconsin, where the company says there is inadequate space for competitors' equipment.

Ameritech also says there is inadequate space to accommodate either physical collocation or virtual collocation in three of the central offices.

On the ATM front, Ameritech plans to offer ATM-based services to selected customers by year end and a generally available service early next year.

Ameritech, the first RBHC to announce plans for ATM-based services, said the network could support frame relay and Switched Multimegabit Data Service.

The carrier has issued an RFP that it says is unique because it invites vendors to include customer premises equipment — such as bridges, routers and multiplexers — that will work with the ATM switches.

An Ameritech spokeswoman said the company will likely roll out ATM services in the six major metropolitan areas in its territory — Chicago, Detroit, Milwaukee, Indianapolis, Cleveland and Columbus, Ohio — and possibly offer wide-area interconnection.

Responses to the RFP are due back to Ameritech by April 9, and the company plans to select equipment suppliers for its ATM network in May.

Senior Editor Bob Wallace contributed to this story.

Monitoring service thwarts toll hacker

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trunk for outbound calls. Trunk numbers in extension fields of call detail records help identify callers that are placing an inordinately high number of outbound calls over one specific switch trunk.

Account-A-Call brought the potential problem to Deskur's attention. He called New England Telephone, which quickly traced the calls to a prisoner in the Boston area.

Unlike many toll fraud situations in which the victimized user and the carrier or switch vendor fight over financial responsibility for the problem, New England Telephone credited Shiva for the calls before they were billed.

"There were probably no more than 100 to 150 calls involved, [which is] not much by toll fraud standards, but the usage mounted as high as 20 hours on one day," Deskur said. "If we hadn't had [Account-A-Call's service], this could have developed into a cost of critical proportions. It certainly underscores the value of detecting toll fraud early."

Users, carriers and PBX vendors were victimized by toll fraud to the tune of roughly $2 billion in 1992, according to specialists who track the industry.

Worth Noting

"Any successful systems management tool will need to incorporate middleware to function effectively in a heterogeneous computing environment."

Peter Tait
Director of product planning
PeerLogic, Inc.
San Francisco

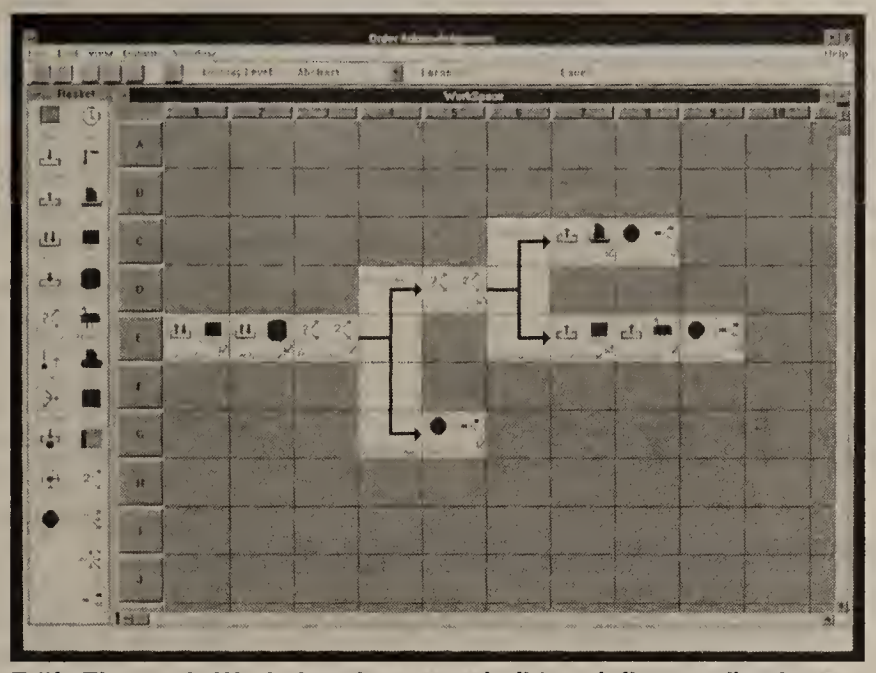
Store & Forward

Heading a pack of group scheduling vendors announcing products, **ON Technology, Inc.** of Cambridge, Mass., this week will unveil Meeting Maker XP, a group scheduling product that allows users of Windows and Macintosh clients to exchange calendar information. The software has virtually the same graphical interface on both platforms and supports any electronic mail package. It stores copies of users' calendars locally and on commonly shared NetWare servers. The product ships next month, and pricing is not yet available.

IBM last week made its entrance into the group scheduling arena by announcing Time and Place/2, which runs on OS/2 and Windows workstations and works across Network Basic I/O System, LAN Server or NetWare local-area networks. It also supports the Vendor Independent Messaging (VIM) interface for communicating with a variety of electronic mail packages. Available next week, Time and Place/2 is priced at $595 for the LAN server and $55 per client.

Campbell Services, Inc. of Southfield, Mich., last week introduced OnTime for VINES,

(continued on page 20)



Edify Electronic Workplace lets users build work flow applications by clicking on icons and placing them in a graphical flowchart.

Edify rolls out enhanced version of work flow pack

Object-oriented product helps automate tasks.

By Wayne Eckerson
Senior Editor

SANTA CLARA, Calif. — Edify Corp. last week introduced a software-only version of its object-oriented work flow technology that makes it easier for users to automate routine administrative tasks.

Edify Electronic Workforce enables nonprogrammers to build sophisticated work flow applications that incorporate interactive voice, data, facsimile and electronic mail technologies. Companies can use the Edify software to handle order status inquiries, send out literature upon request, periodically cull information from various sources to generate a report, and conduct polls — all without human intervention.

The new software, which runs on OS/2 workstations, incorporates a graphically oriented debugger and several new administrative enhancements. The OS/2 workstation interacts with telephones, fax machines, databases and E-mail systems tied to the OS/2 workstation via direct connections to phone lines, corporate private branch exchanges and local-area networks.

Edify Electronic Workforce is similar to interactive voice response (IVR) systems but more versatile and easier to program, according to Tom Glassanos, Edify's vice president of marketing. He said the company competes mostly with IVR suppliers but offers much of the functionality found in emerging E-mail-based work flow products.

The new version of Edify Electronic Workplace supports a debugger utility that checks the validity of application objects and ensures that they reference remote services properly, among other things. From a graphical interface, it then steps through the program, stopping only at breakpoints defined by the developer. This enables developers to see if the system has called up the correct host screens or applied information to the right fields.

> Edify Electronic Workforce is similar to interactive voice response systems but easier to program.
>
> ▲▲▲

New system administration features let administrators define how many resources — such as phones and faxes — to allocate to each application. It also lets administrators customize the look and feel of voice prompts, fax pages and other system resources. Other administrative features let users check the availability of resources and reallo-

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Wanted: middleware mgmt. capabilities

Vendors scrambling to meet user demand for expanded middleware management utilities.

By Wayne Eckerson
Senior Editor

While still in their infancy, middleware vendors are rushing to expand the management capabilities of their products to meet user requirements for reliable distributed applications.

"Customers who have started to deploy middleware on a broad basis are wrestling with the issue of how to manage the technology," said Les Yeamans, vice president of the ezBridge division at Systems Strategies, Inc. in New York.

Middleware is a layer of software that sits between applications and the network and shields applications developers from the complexity of underlying communications protocols. In the absence of true open systems, middleware solves the problem many companies face in trying to link applications across heterogeneous network and computing environments.

Most middleware products come with turnkey administrative and diagnostic utilities that enable users to change configuration tables, control message queues and monitor application and transaction performance. However, few offer the ability to monitor and control middleware components from a central console or third-party management system. But that's soon to change.

New developments

Systems Strategies plans to offer a centralized management console with hooks into IBM's NetView or SystemView management tools sometime early next year, Yeamans said. Like most middleware vendors, Systems Strategies provides individual consoles for each platform its ezBridge Transact product runs on, giving users a localized view of middleware performance but a fragmented global view.

However, according to Yeamans, the problem with managing middleware via NetView, SystemView or even standards-based tools such as the Simple Network Management Protocol is that these tools are not designed to manage software components — such as middleware — that reside at the upper layers of the Open Systems Interconnection model.

"Net management products manage printers, devices and events; they don't manage the application," he said.

To address this problem, San Francisco-based PeerLogic, Inc. is developing a management architecture for its Pipes Platform product that is based on systems management software being developed by Legent Corp., according to Peter Tait, director of product planning. Not coincidentally,

> "We are hoping our relationship with Legent will help break the logjam," Tait said.
>
> ▲▲▲

Legent is using Pipes Platform to provide the communications backbone in its systems management product.

"We are hoping our relationship with Legent will help break the [middleware management] logjam," Tait said.

Hub Vandervoort, president of Horizon Strategies, Inc., said the key to improving middleware management is for vendors to get together and define a standard Management Information Base (MIB) for middleware. Then vendors need to develop agents that can interpret the MIB so it can be used in conjunction with third-party management systems.

He also said the management process would be facilitated if vendors hashed out a common set of definitions for commonly used middleware terms, such as guaranteed delivery and asynchronous communications.

Exploring uses

For its own part, Horizon is exploring the use of middleware to deliver an enhanced set of tools

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Wanted: middleware mgmt. capabilities

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for managing distributed applications. Middleware, for example, could support distributed debugging tools that troubleshoot distributed computing environments.

It could also be used to partition distributed computing networks into production and test networks so users could test the viability of distributed applications without jeopardizing production applications.

Another middleware vendor, Covia Technologies, Inc. of Rosemont, Ill., has already developed a MIB to help it gather diagnostic information about its middleware product, such as the status of message queues, transaction performance and errors.

Covia is currently streamlining the MIB to the lowest common denominator of functions available across all the platforms its product runs on, said Bob Leddy, systems engineer at Covia's Denver office.

Once it finishes streamlining the MIB, Covia plans to make it compatible with the International Standards Organization's Common Management Information Protocol so it can be managed by third-party management systems.

CSI's plan

One vendor that already gives users the option of managing its middleware product either locally or centrally is Creative Systems Interface (CSI) of Framingham, Mass.

CSI is focusing its efforts on allowing users to develop programs that can automatically manipulate middleware services, such as configuration tables and diagnostics, in response to certain events or at predefined times.

For example, this would enable users to automatically reroute interprocess messages around failed links or automatically generate reports from diagnostic information.

"Users are pushing us to provide [application program interfaces] into our administrative system to support automatic management capabilities," said Jim Byrd, vice president of business development at CSI.

Edify rolls out new version of pack

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cate those resources in response to changing business demands.

Edify Electronic Workforce runs applications developed using the Edify Agent Trainer, an object-oriented application generator that lets users develop applications without writing a single piece of code. Users create a script in the form of a flow chart by pointing and clicking on icons that represent predefined actions or objects, such as mailboxes, phones or timers (see graphic, page 19).

Edify also provides a half-dozen commonly used applications that can be purchased separately. These include order status, order backlog reporting, order acknowledgment, shipment history reporting, order change notification, advance shipment notice and literature fulfillment.

Pricing

Available now, the Edify Electronic Workforce costs $10,000 for a system that can simultaneously run two applications and $40,000 for a 10-agent system. The Edify Agent Trainer costs $10,000, and prepackaged applications cost $7,500 each. A third-party developer's kit is available for $15,000.

Store & Forward

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which is group scheduling software that operates across Banyan Systems, Inc. VINES networks.

The advantage of OnTime for VINES, which runs on DOS and Windows personal computers, is that it passes calendar updates in real time. This ensures that users are working from the most up-to-date calendars, avoiding potential scheduling conflicts. In contrast, most group scheduling packages distribute calendaring information using store-and-forward electronic mail, which introduces a time delay in the delivery of information.

The product costs between $25 and $56 per user for volume purchases of 100 or more copies.

Manteno, Ill.-based **Powercore International** last week announced an agreement with Isocor to integrate Powercore's group scheduling and electronic mail software with Isocor's X.400 messaging servers. Later this year, Powercore will ship a new version of Network Scheduler 3 and its WinMail E-mail package that will use the X.400 servers from Isocor.

Worth Noting

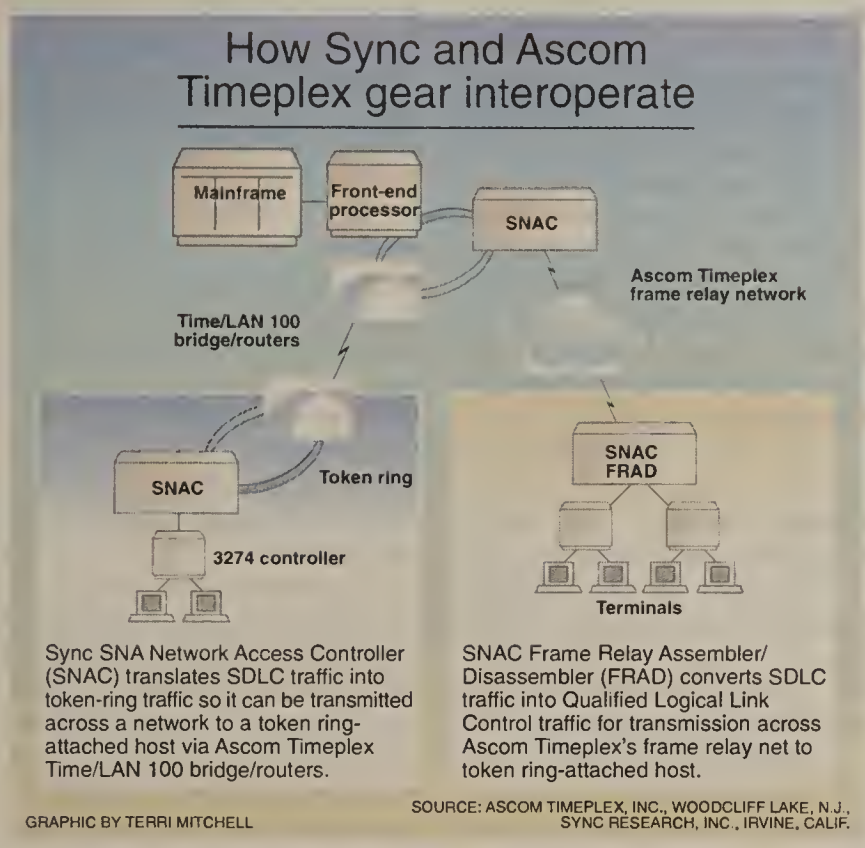
The market for integrated net management systems will more than quadruple between now and 1996, when it will reach $395 million, according to Business Research Group, a Newton, Mass., market research firm. Some 80% of the 400 MIS executives interviewed by the firm said they will install integrated net management systems within the next 24 months.

People & Positions

Jeffrey Papows last week was named to the newly created position of vice president of **Lotus Development Corp.**'s Notes product division. He will be responsible for growing Notes' business. Papows was previously president and chief operating officer of Cognos, Inc., a Burlington, Mass., software vendor.

As part of a reorganization of its communications software business, Lotus said it is giving responsibility for its cc:Mail electronic mail business to **Larry Crume,** vice president of Lotus' mobile computing division.

Ultra Network Technologies, Inc., a San Jose, Calif., vendor of hubs and adapters for mainframes, has named **Michael Paul** president and chief executive officer. Previously, Paul was the company's vice president of sales. He replaces Ray Fortune, who served for two years on an interim basis and departed for personal reasons.



Ascom Timeplex, Sync pen sales, support pact

Resale includes SNA converter, frame relay gear.

By Bob Brown
Senior Editor

WOODCLIFF LAKE, N.J. — Ascom Timeplex, Inc. and Sync Research, Inc. last week announced they have signed an agreement under which Ascom Timeplex will resell Sync SNA conversion and frame relay products in North America.

Ascom Timeplex, based here, also has been chosen by Irvine, Calif.-based Sync as its North American third-party service and support organization to provide field support to users of Sync's SNA Network Access Controller (SNAC) products.

Nye

The pact will enable Ascom Timeplex to better serve IBM Systems Network Architecture users looking to migrate from leased lines to frame relay links or switched services, said John Moore, Ascom Timeplex's director of worldwide marketing. Sync's SNAC products are designed to link IBM Synchronous Data Link Control controllers to token rings.

Using a SNAC/Token-Ring Converter, Ascom Timeplex customers could link SDLC devices to token rings and then forward the data across a wide-area network based on Ascom Timeplex Time/LAN 100 bridge/routers to a token ring-attached host.

They could also convert SDLC traffic into Qualified Logical Link Control data using Sync's SNAC Frame Relay Assembler/Disassembler product for transmission over an Ascom Timeplex Timepac frame relay net to a host (see graphic, this page).

The deal will buy Ascom Timeplex some time in which to build SNA conversion capabilities of its own into its Timepac X.25 and frame relay offerings, Moore said. The company has yet to set a date for when such capabilities will be available.

Sync's agreement with Ascom Timeplex for service and support could far outlast the resale agreement. By choosing to partner with Ascom Timeplex, Sync's products will be supported by a 500-person North American support organization.

The Ascom Timeplex partnership is the most recent in a string of alliances established by Sync, which also has alliances with Cabletron Systems, Inc., McDATA Corp. and 3Com Corp.

One difference between Ascom Timeplex and some of these other companies is that Ascom Timeplex is already well established in many large SNA nets, said Lynn Nye, Sync's director of product marketing. Sync considers the Ascom Timeplex agreement as a way for Sync to gain access to IBM accounts, he said.

Industry tentatively blesses Clinton plan

Applauds plans to cut deficit and tough stance on trade issues but wary of proposed tax hikes.

By Ellen Messmer
Senior Correspondent

WASHINGTON, D.C. — Broad segments of the telecommunications and networking industry are praising President Clinton's new economic plan, although the administration's proposed tax hikes have them worried.

Some items, such as a research and development tax credit, capital gains provisions and federal dollars for networking projects, are planned to be in the budget bill that Clinton will send to Congress next month. These items have garnered approval from several trade groups, including the American Electronics Association, the U.S. Telephone Association and the Computer Systems Policy Project (CSPP).

Industry applauded the plan's focus on reducing the deficit through federal spending cuts elsewhere, but many have expressed dismay over the proposed tax hikes, which would raise the corporate tax rate from 34% to 36% for taxable income over $10 million.

Although some U.S.-based companies appear delighted to see the new administration take a tough stand against unfair trade practices in foreign markets, they are worried that policymakers will go too far, leading to protectionism that could damage world trade relations.

Last week, during a visit to Silicon Graphics, Inc. in Mountain View, Calif., Clinton and Vice President Al Gore said they want to increase federal dollars for civilian-related R&D and decrease defense-related R&D spending to make them equal by 1998. In what is largely a symbolic gesture, Clinton said he will strip the word "defense" from the Defense Advanced Re-

(continued on page 22)

INDUSTRY BRIEFS

Teleport buys Diginet. Teleport Communications Group, a large alternative access carrier based in Staten Island, N.Y., last week announced plans to buy the assets of Diginet Communications, Inc., a Milwaukee-based alternative access provider. Teleport will fold Diginet's 47-route mile network in Chicago into its own Chicago net, while Diginet's 19-route mile network in Milwaukee represents a new city for Teleport. Terms of the acquisition were not disclosed.

Novell, PacBell unite. Novell, Inc. and Pacific Bell have formed a marketing alliance under which Novell resellers will be able to integrate Novell's wide-area networking products with Pacific Bell data communications services. Novell resellers will work with Pacific Bell authorized sales representatives to sell Pacific Bell's services with Novell's NetWare WAN Links product and NetWare MultiProtocol Routers. Some Novell Gold and Platinum resellers will be authorized to sell Pacific Bell's services directly.

CLI thrown for a loss. Compression Labs, Inc. posted a $1.9 million loss for the fourth quarter. That compares with a $17.7 million loss in the fourth quarter of 1991, which was largely the result of an $18.9 million charge against earnings. Quarterly revenue grew 45% to $31.2 million.

(continued on page 22)

Industry Briefs

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For the year, revenue increased 48% over 1991 to $107.8 million, but the company lost $3.3 million. CLI executives said videoconferencing product orders were in line with expectations but earnings were hurt by a shift in sales from high-end, high-margin videoconferencing systems to lower margin personal computer-based videoconferencing systems and broadcast television products.

FastComm shows growth. FastComm Communications Corp., a Sterling, Va., vendor of network access devices, announced third-quarter revenue of $1.7 million, a 78% increase over 1991's third-quarter revenue. Quarterly earnings grew to $322,940, turning around a loss of $470,557 in the third quarter of 1992.

Firm makes glum forcast. VideoTelecom Corp., an Austin, Texas, videoconferencing system vendor, reported fourth-quarter revenue of $6.9 million, up 35% from the same quarter in 1991. Earnings fell 29% to $82,000. For the year, VideoTelecom had revenue of $26.1 million, more than double 1991's $11 million in revenue. The company showed earnings of $1.5 million for 1992 compared to a loss of $2.4 million in 1991. VideoTelecom executives said they expect the company to show an operating loss in the first quarter of 1993.

Recording strong revenue. Optical Data Systems (ODS), Inc., a Richardson, Texas, wiring hub vendor, reported fourth-quarter 1992 revenue of $13.6 million, 23% better than what was achieved in the fourth quarter of 1991. Quarterly earnings were up 66% to $1.7 million. For the year, ODS had revenue of $49.2 million, 33% better than 1991's revenue. Earnings more than doubled to $5 million last year from 1991.

Company signs partners. GammaLink, a Sunnyvale, Calif., vendor of facsimile server hardware, has announced partnerships with six fax server software developers. Charter members of GammaLink's new Fax Server Partner program include the following: Alcom Corp., Cracchiolo & Feder, Inc., OCTuS, Inc., Optus Software, Inc., Traffic Software and TransFax.

Industry blesses Clinton plan

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search Projects Agency, which grants funds to industry for high-technology research. The president and vice president also voiced support for an information superhighway to link digital libraries and universities.

The Department of Commerce will receive $64 million in funding to coordinate network-related demonstration projects with industry participants under the recently released Clinton budget plan, called A Vision of Change for America.

The CSPP, a policy advocacy group representing the chief executive officers of the largest U.S.-based computer firms, gave a thumbs-up on the proposed broadband network for linking schools, libraries, medical facilities, government and other public information producers.

"The technology demonstration projects in health care, education and manufacturing called for by President Clinton will help ensure that the components of that infrastructure will work together effectively and efficiently to solve real problems facing all Americans," said John Sculley, CEO at Apple Computer, Inc. in Cupertino, Calif.

The Clinton budget plan also details a number of so-called technology investments to provide information systems for government agencies.

The National Oceanic and Atmospheric Administration will receive $81 million for modernization of the National Weather Service, the Department of Health and Human Services will get $302 million for processing disability insurance claims, and the U.S. Department of the Treasury will get $1.8 billion over four years for its Tax Systems Modernization, which lets the Internal Revenue Service process claims electronically ("Treasury to use electronic signatures," *NW,* Feb. 22).

Clinton also wants to upgrade the Social Security Administration (SSA) computer systems. Saying that SSA "must abandon their labor-intensive, paper-driven tradition and automate," the president hopes to give the agency $880 million over four years to buy workstations and local-area networks to process claims electronically.

To help come up with the funds for the federal projects, the Clinton administration is prepared to back the notion of spectrum auctioning, an idea long debated on Capitol Hill and traditionally advocated by Republicans, not Democrats.

The administration plans to support legislation to transfer 200 MHz of government-used radio spectrum to private industry. The bill would also authorize the Federal Communications Commission to assign the new spectrum, as well as other future license assignments, using auctions rather than the current lottery process.

At the recent Mobile '93 show in San Jose, Calif., George Fisher, Motorola, Inc. chairman and CEO, expressed guarded optimism about what impact the new Washington regime will have on the wireless communications business.

"I suspect for our industry the Clinton administration will be reasonably positive, as long as it concentrates on opening new markets as opposed to protecting this market," Fisher said.

He emphasized that the country should not fall prey to a protectionist attitude but said it was "important that we aggressively pry open markets and, if necessary, use the leverage of our own market to make that happen."

Vendors offer remote options

continued from page 13

to whatever server drives that machine has access to.

The new product also adds a SmartXchange feature for automated file transfers and updates. To automate the file transfer process, LapLink V includes a macro capability to capture file transfers, backups and updates, then replay them later at specified times or dates. These events can occur over the network or via dial-up connections.

SmartXchange also allows remote users to synchronize disks based on file size, date and time. The bidirectional synchronization rewrites older files while leaving duplicates untouched. A refresh capability updates matching files without copying other files. The process can occur remotely or over the network, and includes conflict resolution routines and exception controls.

LapLink V, complete with parallel and serial cables for direct connections between PCs, is available now for $169. LapLink V for NetWare, an identical product that ships without cables, will be available in April for $99. A five-pack of LapLink V costs $599, and site licenses are available for orders of more than 200 copies.

DigiBoard's PC IMAC is a personal version of the Eden Prairie, Minn.-based company's IMAC integrated ISDN terminal adapter/LAN bridge. While the standard IMAC is typically used to link multiple LANs via ISDN, PC IMAC is designed for telecommuters who want to connect to the corporate LAN over ISDN lines.

Consisting of a 16-bit Industry Standard Architecture card for PCs running NetWare, the PC IMAC is not designed for mobile use, but rather for individual desktop PC users at remote sites equipped with ISDN connections. PC IMAC users simply dial into the IMAC box attached to the corporate LAN.

With ISDN connections allowing speeds up to 128K bit/sec, users of the PC IMAC do not suffer the enormous performance hit caused by most remote-control software packages and can use standard LAN applications without modification.

According to DigiBoard, the PC IMAC is available now for $995. Prices for the standard network IMAC begin at $2,195.

Network General to add to DSS

continued from page 13

bilities administrators need for their own environments.

Poor memory

Valentin Sribar, a senior research analyst with the global networking strategies service at META Group, based in Westport, Conn., described the Expert Sniffer as "a Sniffer with Alzheimer's disease."

Its AI capabilities can help find problems with the network, Sribar said, but "once you unplug [Expert Sniffer], it forgets everything it just worked on.

"Generally, the idea of moving these capabilities down [to remote offices] makes sense — usually [personnel in] the remote offices know even less than the central administrator," Sribar added. "But the technology needs to develop further to be able to identify all the problems, not just some of them."

Univ. develops new LAN scheme

continued from page 13

send, a video clip, for example, workstation software determines the needed bandwidth and requests it from the system monitor, which approves or denies the request based on availability.

Administrators can determine how long a workstation must wait to have a request approved, usually about two seconds. If the request is still denied, they can set up an appropriate interval to wait before trying to resend the data.

According to Varshney, LMN improves on other schemes, such as certain 100M bit/sec Ethernet proposals, because video quality does not degrade as more users are added to the network and collisions increase. It also supports distances of 5 to 6 km end to end, whereas some 100M bit/sec Ethernet proposals limit the LAN to 250 meters in diameter.

LMN improves over technologies that add an isochronous channel to packet-based LANs because it enables users to take advantage of all available bandwidth for any information type — voice, video or data.

Varshney said CTR is seeking vendor support for developing LMN adapters, which could be available as early as next year. He declined to name the vendors.

Netnotes

continued from page 13

System 7 users to dial into the LanRover for transparent access to net services. Shiva is shipping the ARA client software on two floppy disks at no extra charge to those that buy the LanRover/L, LanRover/4E and LanRover/8E. Users that bought the LanRover products after Nov. 11 can get the client software for free.

Digital Products, Inc. has introduced PrintLynk, a simple modular printing network for personal computers. Designed for organizations that want to share printers without the hassle and expense of installing even a peer-to-peer local-area network, PrintLynk allows as many as 16 PCs to share a parallel printer at a cost of about $65 per computer.

The PrintLynk transmitters for the PCs cost $60 each, while the receiver for the printer costs $65. A kit to connect two PCs to one printer — including wiring — costs $195. PrintLynk is available immediately from Digital Products in Waltham, Mass.

ATM TECHNOLOGY

INVITATION AN INVITATION

To users of

ATM AND NEXT GENERATION NETWORKS

What: Enterprise Network Users Roundtable Kick-off Meeting (in conjunction with INTEROP 93 Spring)

When: Thursday, March 11, 9:00-4:45

Where: Sheraton City Centre Hotel
City Center Ballroom, Washington, DC
Metro: Foggy Bottom
Phone: 202-775-0800

PLAN and PROTECT the FUTURE of Your NETWORK

The Enterprise Network Users Roundtable

The Enterprise Network Users Roundtable (ENUR) is a newly-forming user organization initiated by Hughes - a leading end-user that recently announced its commitment to ATM technology. ENUR's mission is to accelerate availability of commercially-viable next-generation ATM networking products and services. ENUR will articulate, document and defend users' interests in the development of the ATM market.

Who Should Attend

All users, or potential users, of ATM products and services should attend. Vendors, analysts, the press and consultants are requested not to attend this formational meeting but please encourage your customers to attend.

Why You Should Attend

ATM offers you higher networking performance and capability, greater manageability and lower costs. Your early involvement in ENUR will help your organization get maximum payoff from this transformational technology. Your participation in ENUR will also help ensure ATM does not become a confusing alternative that fails to meet its promise. Please get involved. Make sure your needs are met.

For More Information & RSVP

You can participate in ENUR even if you can't attend. For more information (or to RSVP) please contact Joel Campbell or Bud Huber of Hughes Aircraft Company at 310-364-6582 (please leave voice mail), Internet: 72130.1217@CompuServe.com or Fax: 310-322-4294.

We thank these corporate sponsors who have supported the launch of the Enterprise Network Users Roundtable:

Agenda

9:00 -9:15
Introduction
Bud Huber, Hughes Aircraft Company
Introduction of ATM Forum Board Members and selected attending dignitaries.

9:15-9:30
Why Hughes Needs ATM
George Buchanan
Manager, Hughes Business Communications

9:30-10:00
When is ATM the Right Solution for Your Business Requirements?
Dr. John M. McQuillan, President
McQuillan Consulting

10:15-11:00
The National Infostructure Campaign
Frank Crivello & Jim Hake, Co-Founders
Access Media Inc
Description of plans for a national interdependent marketing campaign to accelerate implementation of a digital information infrastructure, or "Infostructure". The role users and the ENUR can play in the Campaign and in the development of the Infostructure will be highlighted.

11:00-11:30
Moving From Interoperability to Interworkability
Einar Stefferud, President
Network Management Associates, Inc.

11:30-12:00
Establishing Our Organization
Bud Huber
Discussion of ENUR goals, methods, structure and membership.

12:00-1:15
Lunch Break

1:30-2:00
What Vendors Need From a Users Group
Bill Pfeiffer, Sr. Vice President
Sprint Communications Company

2:00-4:45
Establishing Our Organization (cont.)
Bud Huber

ACCESS MEDIA INC · The ATM Forum · COMMUNICATIONSWEEK · HUGHES Subsidiary of GM Hughes Electronics · NETWORK WORLD

ENTERPRISE NETWORK USERS ROUNDTABLE

Worth Noting

"Open systems is a change in the power relationship between the end user and the vendor. It's about end users controlling their destiny, being in charge of what gets purchased and installed, and mandating that the vendors make sure it works well together."

Jonathan Gossels
Business area manager
Open Software Foundation, Inc.
Cambridge, Mass.

Manager Minutes

Digital Consulting, Inc. (DCI) is sponsoring the National Software Reengineering and Maintenance Conference April 20-22 in Chicago.

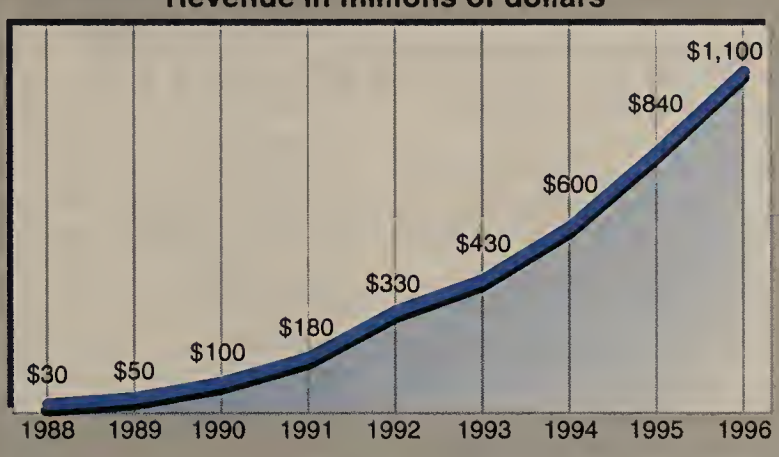
The conference is divided into three tracks — management issues, tools and technologies, and user success stories — which are designed to help managers understand and implement successful reengineering initiatives.

Special sessions include Comparison and Evaluation of Software Redevelopment Tools, Business Value-Driven IT Process Reengineering, and Implementing Software Reengineering Strategies and Projects.

In addition, the conference features a luncheon in which attendees are encouraged to bring any problems they have encountered in the reengineering process to be worked on and solved by industry experts.

For more information about the conference, contact DCI at (508) 470-3880.

Users push videoconferencing to new heights



As users such as Management Recruiters International, Inc. come up with new ways to employ the technology, the market for videoconferencing equipment is expected to soar.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: THE YANKEE GROUP, BOSTON

Client/server nets spark need for computing skills

Wanted: experts in multivendor technologies.

By Bob Brown
Senior Editor

NEW YORK — The move away from centralized, mainframe-based information systems (IS) to local-area networks has created the need for a new class of IS professionals with client/server computing skills.

According to management consulting firm Edward Perlin Associates, Inc., based here, companies are reorganizing their information technology staffs to support technology changes.

As evidence of the transformation, the consulting firm has added a slew of new job titles — such as database technical specialist and personal computer/LAN management manager — to its 1993 Salary Survey of Data Processing Professional Positions. The firm is surveying the human resources departments of more than 60 companies and expects to send survey results to those firms this summer.

"Human resources departments are advertising for professionals with client/server expertise and are interested in finding out what the market is paying these people," said John Warlikowski, a senior consultant at Edward Perlin Associates. "My impression, even before getting our results back, is that they are getting paid well because they are scarce."

Warlikowski advised that beefing up one's client/server skills, which typically includes gaining expertise in multivendor communications technologies, is a wise career move. While it is not entirely clear where companies are searching for client/server experts, many of them are known to be retraining their own MIS professionals, he said.

The demand for client/server experts has been strong through the recession and is expected to remain solid, the firm said.

Another interesting finding by the consulting firm is that many companies are looking for ways to reward highly skilled technical experts who have little inclination to move into management jobs where they have no proven skills. Many companies have begun using the term "technical specialist" to refer to these top-level technical experts, who they need to retain, Warlikowski said.

> The demand for client/server experts has been strong through the recession and is expected to remain solid.
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For more information on the 1993 salary survey, call (212) 714-0588.

Videoconferencing gives recruiter edge

Technology lets Management Recruiters conduct interviews, sparing clients the expense of travel.

By Joanne Cummings
Senior Writer

CLEVELAND — Videoconferencing technology is giving a recruitment firm here a competitive edge by helping the company provide its clients with a low-cost option for long-distance interviewing of job candidates.

Management Recruiters International, Inc. (MRI) is using a videoconferencing system officially unveiled by Compression Labs, Inc. (CLI) last week to conduct interviews between a client company in one of its 600 offices and a job candidate in another. For about $250 per half hour, the MRI service offers a huge cost savings for clients, who had been spending between $1,600 and $1,700 per candidate for travel, lodging and meals.

"This really gives us an edge in the recruitment field," said Stephen Fogelgren, vice president of operations at MRI. "When companies factor in the cost savings [for travel], they'll find that's more money than our total fee. None of our competitors can say that."

Videoconferencing gives employers an effective means of winnowing the field of prospective candidates, Fogelgren said.

"This won't replace the final face-to-face interview," he said. "But most firms find they need to do 10 or 12 initial interviews before they narrow down the field to the one or two people who most interest them."

The ability to see candidates and evaluate them via the videoconferencing system increases the value of the information obtained by three or four times that of telephone interviews, Fogelgren said.

"We're looking at the quality of the person's presentation," he explained. "The words we use make up less than 40% of the actual message; the rest is facial expression, eye movement, hand gestures. In an interview, you're looking for quality characteristics, like honesty and forthrightness, and you can learn a lot about those from body language."

MRI decided to make the investment in videoconferencing after evaluating systems from the top three U.S. manufacturers and several Japanese firms. In the end, it chose to base its project on CLI's new Eclipse system.

"CLI showed us what they had planned for the Eclipse, and it looked like our best option," Fogelgren said.

The Eclipse had all the features the firm needed at a very low price. "With every system, there are a series of trade-offs as to ease of use, cost and quality," Fogelgren said. "The Eclipse is one of the lowest priced systems, is very easy to use, and the quality is the same as the others we examined."

MRI uses public switched 56K bit/sec services to link its videoconferences. It has 50 units installed but plans to increase that to 250 by year end and, eventually, to all of its 600 offices.

> MRI arranges more than 250,000 interviews per year, 90,000 of which involve travel.
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MRI arranges more than 250,000 interviews per year, 90,000 of which involve candidate travel. "This is really going to keep costs down for everyone involved," Fogelgren said.

MRI also hopes to utilize the systems to enable small companies to perform on-campus recruiting at colleges. Since today only the largest firms can send recruiters directly to campuses, videoconferencing should help smaller firms compete for top candidates.

"Eventually, we'd like to install a videoconferencing unit in our offices near every major college campus," Fogelgren said. "That would enable the smaller firms to even the playing field and get a fair crack at the brightest candidates."

HIGH-SPEED NETWORKING

BY GORDON COOK

Affordable access is key to NREN's success

Federal policymakers have been focusing too much on using the National Research and Education Network (NREN) as a vehicle for technology transfer. As an expansion of the National Science Foundation's Network (NSFNET) portion of the Internet, NREN is already a commercially viable information highway. The very rapid growth in private-sector Asynchronous Transfer Mode development makes it unlikely that NREN will be a major vehicle for fast packet switching technology transfer.

Instead, federal policymakers must define the national interest inherent in NREN access. NREN access now and in the future will be critical for many small businesspeople. If NREN is to remain free of regulation, its providers must maintain the cost of individual access in the $20 to $30 a month range, the current price for Internet access in many parts of the U.S. If NREN access is not affordable for all, it will divide this nation into two unequal classes — the information rich and the information poor.

A misleading Office of Technology Assessment background paper, titled "Gigabit Testbeds and NREN Technology," treats NREN only as a technology and ignores many critical policy issues. NREN does have an important technology development component found not in the operational network, but rather in the gigabit test beds coordinated by the Corporation for National Research Initiatives. The test beds have leveraged federal money and assisted the private sector in developing precompetitive high-speed network technology. They represent a successful experiment in industrial policy — one that the new administration should capitalize on.

As the contentious NSF backbone privatization experiment with Advanced Network and Services — an IBM/MCI Communications Corp.-funded nonprofit company that was granted the exclusive right to sell commercial access to what had been the NSFNET backbone — shows, federal funding of an operational NREN would mean the use of taxpayer dollars for something that the private sector is ready to provide. While the new NSFNET backbone may fall between experimental test bed quality and the production standard of a commercial network, the NSF should not be permitted to indulge in ephemeral cost-sharing with its high-speed backbone provider in return for a monopolistic right to sell commercial access.

Instead of paying network providers, the federal policymaker should represent and enforce the broadest public interest in the network — public standards, interoperability with other networks and the broadest possible public access.

This point was emphasized in a recent article in a national newspaper that stated, "The rapid expansion of the Internet's reach makes the cost of access for poor nations and [poor] individuals a primary consideration. [Vinton] Cerf, [one of the network's designers], said, 'It will become critical for everyone to be connected. Anyone who doesn't will essentially be isolated from the world community.' "

Cook is publisher of the monthly newsletter "The COOK Report on Internet-NREN." He can be reached by internet email at cook@path.net.

NETWORK WORLD

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Executive Editor
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Assistant Managing Editor — News
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Senior Editors/News Coordinators
Bob Brown — Industry Update
Wayne Eckerson — Enterprise Applications
Bob Wallace — Global Services
Caryn Gillooly — Local Networking
5423 Gladewright Dr., Centreville, Va. 22020
Phone: (703) 266-1537
Fax: (703) 266-1543
MCI Mail: cgillooly

Senior Editors
Michael Cooney — Data Net Architectures
14701 Bentley Sq., Centreville, Va. 22020
Phone: (703) 830-8138
Fax: (703) 830-7963
Jim Duffy — Data Net Architectures

Senior Writers
Joanne Cummings — Management Strategies
Reader Advocacy Force Coordinator
67 Highgate Rd., Marlborough, Mass. 01752
Phone: (508) 481-6061
Fax: (508) 485-5809
Maureen Molloy — Internetworks

Staff Writer
Skip MacAskill — Internetworks

West Coast Bureau
Timothy O'Brien
Bureau Chief/Enterprise Applications
Phone: (415) 771-3530
Fredric Paul
Senior Editor — Local Networking
2088 Union St., Suite 2
San Francisco, Calif. 94123
Phone: (415) 771-4103
Fax: (415) 771-2817

Washington D.C. Bureau
Anita Taff
Bureau Chief/Global Services
Phone: (202) 879-6744
Ellen Messmer — Senior Correspondent
National Place
1331 Pennsylvania Ave. NW, Suite 505
Washington, D.C. 20004
Phone: (202) 879-6752

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Network World
161 Worcester Road
Framingham, Mass. 01701
(508) 875-6400
MCI Mail — 390-4868
Fax: (508) 820-3467
R.A.F. hot line:
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EDITORIAL

Effort to forge government/business bond has merit

It's ironic that some industry leaders and policy experts who extol the Japanese business model should criticize the Clinton administration's new technology policy as Big Government intervention in the workings of private enterprise.

In Japan, the government is clearly in the business of identifying growth industries and working hand in hand with Japanese business leaders to ensure success, if not dominance, in those markets. Why should things be different in the U.S.?

As the global marketplace becomes more competitive, the adversarial relationship between U.S. business and government simply must change, and Clinton's plan is a start. The government can play a role in nurturing developing industries and ensuring U.S. competitiveness in key future markets.

Free-market purists poohpooh that, saying government is an ineffective venture capitalist and has no right meddling in the forces of the marketplace. Government, they say, cannot work with the efficiency of the market's free hand.

The U.S. government has failed in some efforts, but its record isn't as bad as critics would have you believe. One need only consider the Internet to see what innovation and change the government can spur.

By establishing the foundation networks upon which the Internet has grown, the government — aided by incredible user demand — has fueled the creation of a vital, interactive information infrastructure that grows by leaps and bounds.

That's something the litigious, mostly inefficient telecommunications industry hasn't been able to achieve in more than 100 years. The Internet may be difficult to navigate at times, but it's better than anything the private sector got rolling on its own or will establish anytime soon.

Overall, the Clinton administration's technology plan makes sense — particularly establishing a permanent research and development tax credit to fuel growth — and it warrants real consideration. After all, what could be more pro-business than an active partnership of government and business?

SECURITY PERSPECTIVES

BY MICHEL KABAY

Viruses should not be protected by First Amendment

Many writers have described virus mechanics — how individual viruses work or how classes of viruses avoid detection. Most have used general descriptions or pseudo-code.

Other writers, however, have published articles and books that include the precise machine codes required to recreate a virus. Such an act should be illegal.

Nonetheless, some people who hate viruses, despise virus writers and advocate penalties for writing and distributing viruses, feel strongly that no one should be prevented from publishing virus code.

For instance, one prominent member of the antivirus community has said, "My concern is that if we can justify the suppression of information as undesirable or potentially dangerous, is it that much further a jump to the suppression of other information?"

I contend that First Amendment rights do not apply to virus code.

The arguments protecting an author's right to publish detailed, functional virus code are based on the following questionable assumptions:

- All speech is protected under the First Amendment of the U.S. Constitution.
- Written virus code is speech.
- Therefore, writing and publishing virus code cannot be forbidden by law in the U.S.

However, Professor Virginia Black of Pace University in New York, a specialist in law philosophy, points out that not all speech is protected.

One can prevent or punish a person for their speech on many grounds, even in the U.S. For example, Black says, one can:

- **Show that such writing is harmful.** This approach balances harmful consequences against a right. Any claimed harmful consequences would have to be concluded as serious, "for all the time people harm each other, and we would live in a totalitarian state if every alleged harm were legally prohibited," Black notes.

Most network administrators and users would agree that viruses are harmful things that waste time and money. Recent research studies indicate that the average downtime due to a virus infection runs about four hours and costs each affected user about $800 in lost productivity.

> One can punish a person for their speech on many grounds, even in the U.S.
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- **Show that such writing amounts to a speech act and, therefore, is not protected under a freedom-of-speech law because its intent is to act or get others to act in a certain way.** Therefore, inciting others to commit crimes is not protected speech. I argue that publishing virus code constitutes inciting a crime.
- **Show that whereas something may be a form of speech, it nevertheless abridges or interferes with another right that people have.** Just because something may be speech, it does not automatically take precedence over every other right we accept.
- **Argue from an age-old equity principle: The law does not protect wrongful gain — that is, one may not gain from another's loss.** The person who publishes the virus code profits through the sale of the book, which tells some unscrupulous person how to write a virus that causes someone else's loss. Therefore, the author is indirectly profiting from someone else's loss.

But is virus code speech, let alone protected speech?

Consider a computer program expressed as machine language codes — for example, 0001010000110101. I don't consider these codes to be speech; they are programs.

Programs are currently treated as literary works; they can be copyrighted but not patented. In my opinion, this is a mistake.

It's irrelevant how we represent computer programs. A program is a set of instructions, not the medium in which they're coded. A program in Assembler language is a program whether it resides on a hard disk, a floppy diskette or a portion of a memory array.

Indeed, that sequence of computer instructions would be the program itself, even if it were written on a papyrus, chiselled in stone, signalled by semaphore or printed in a book.

Viruses are programs. Virus code should not be considered protected speech.

It will be a difficult task distinguishing between legitimate and illegitimate representations of virus code, but the job has to be done.

Kabay is director of education at the National Computer Security Association in Carlisle, Pa. He can be reached on the Internet at 75300.3232 @compuserve.com or by telephone at (717) 258-1816.

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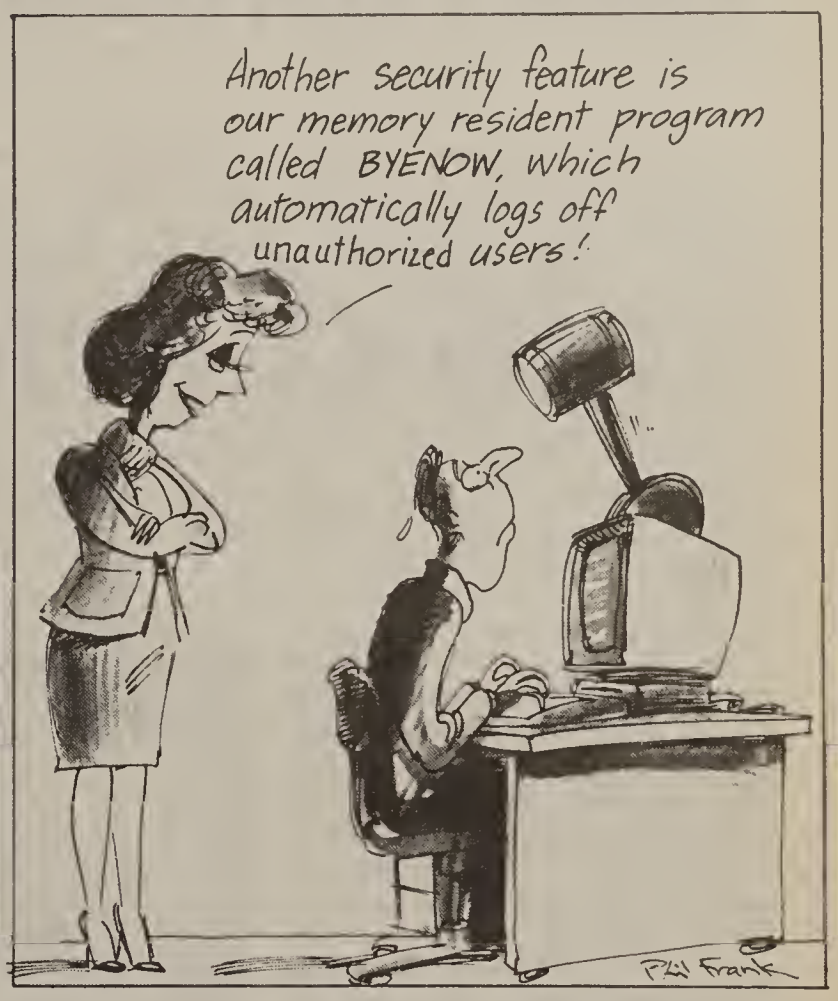
TELETOONS

BY FRANK AND TROISE



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Distributed computing meets object-oriented technology

Distributed object computing emerges from the dust cloud as two popular technologies collide.

Two of today's most powerful information technologies are on a collision course and are likely to meet in a big bang that creates a new world of network applications. The already symbiotic distributed computing and object-oriented software environments have been headed at each other for more than a decade, but the melding of the two to form a distributed object computing environment has picked up speed during the past few years.

The founding of the Object Management Group (OMG) in 1990 was perhaps the first broad-based recognition that object-oriented software development could make distributed computing platforms much easier to access and manage than they are today. More recent events indicate that distributed object computing is starting to enter the mainstream of corporate computing.

Last year, the Petrotechnical Open Systems Corp. (POSC) of Houston, a nonprofit cooperative research consortium, announced it will recommend that its members adopt a standard distributed object computing architecture. POSC is responsible for defining the petrochemical industry's next-generation information system architecture and greatly influences the technology selection decisions of the nation's leading oil companies.

At NetWorld 93 Boston last month, Novell, Inc. announced its intent to ship Westborough, Mass.-based HyperDesk Corp.'s Distributed Object Management System with NetWare 3.X and 4.0 starting later this year. This will make distributed object computing support available for free on one of the most popular local-area network operating systems.

The pace will quicken further this year. Sun Microsystems, Inc., Hewlett-Packard Co., Digital Equipment Corp., IBM and others are expected to commit to supporting distributed object computing.

More users will adopt distributed object computing as their strategic architecture for new applications this year, as well. Citibank, N.A., Federal Express Corp. and other firms have already made progress in implementing distributed object computing. A dozen other major users will report on their progress in implementing distributed object computing at the Patricia Seybold Marathon Week conference April 19-23 in Boston.

"Object-oriented technology and networking are emerging as the fundamental components of distributed computing," says Christopher Stone, president of Framingham, Mass.-based OMG. "Eventually, standards established for object-oriented technology will allow applications to have true distribution and location transparency, providing real interoperability across network protocols."

The implications of this shift to distributed object computing are huge. Client/server applications can be developed in a fraction of the time it takes today by enabling clients to plug into software objects stored in server-based object libraries. These objects are basically software modules that contain a variety of elements, such as specific pieces of data or predefined application processing routines.

Application development time is trimmed because a developer only has to write client code that sends requests to use an object over the network. The object can respond to the request by returning a piece of data or performing an operation.

Without object-oriented technology, development of client/server applications is much more complex. The level of detail developers must master to define interactions between clients and

By JOHN RYMER

servers in a traditional client/server environment is large and requires the use of complex application program interfaces (API).

For instance, using remote procedure calls (RPC) to make sure a client's request for service is sent to the proper server requires mastery of dozens of APIs and arcane programming parameters. To the average corporate application developer — who typically has a background in COBOL — this task is akin to programming in Assembler. Even developers trained in C language have trouble learning it.

While distributed object computing benefits developers, it can make life more difficult for network managers. The traffic generated when clients communicate with server-based objects will likely strain enterprise networks, further complicating the struggle to keep them up and running.

Another drawback is that users will need more powerful client and server processors to run distributed object computing applications.

What it is

Distributed object computing's benefits are too important to ignore, however, even for users struggling to understand exactly what distributed object computing is and how it can be implemented. Simply put, distributed object computing combines the best of distributed computing and object-oriented technology.

Distributed computing provides a way to run parts of applications, such as screen displays and functional logic, on separate clients and servers that communicate using a protocol that defines the structure and prerequisites for the interaction. In a client/server database management system application, for example, the protocol is a network version of the SQL language. Interactions between the client and server can take place through a variety of mechanisms, including synchronous sessions, shared queues, asynchronous messages or RPCs.

Object-oriented technology enables developers to build applications using objects, which are sets of independent software modules that represent arbitrary, complex concepts. Objects are independent of one another but can interact by exchanging messages that contain requests for services and responses to those requests.

Each object comprises three essential components: data; methods, which are functions that perform such operations as adding up numbers or displaying data on a workstation screen; and attributes, which define the characteristics of the object, such as when it was created, who created it and which font it will use to display data. These three components form an object's internal implementation and are encapsulated into a software module.

By encapsulating an object's implementation, developers do not have to understand the object's details in order to use the object. Rather, all a developer has to do is embed the object name in a client application, give the client permission to use the object and make sure the client transmits any special parameters the object will need to perform its task.

For example, to perform an operation on a particular set of data, the developer writes client code that sends a message over the network to the object that can perform the operation. The developer doesn't have to define the operation or code the operation into the client application.

Object-oriented technology also

(continued on page 30)

Different terms but similar meanings

The worlds of distributed computing and object-oriented technology have evolved separately over the years, but they are actually symbiotic in nature. Each world shares at least six core concepts. The words defining these concepts are different, but their meanings are essentially the same (see graphic, this page).

Following is a listing of distributed computing terms, their object-oriented technology counterpart and a brief definition of each:

Mapping the terms
Figure 1

Distributed computing	Object-oriented technology
Protocol	Interface
Process	Object
Communications links	Messages
Function	Method
Type	Class
Client and servers	Objects

Terms used to describe distributed computing concepts have counterparts in the object-oriented technology world.

SOURCE: PATRICIA SEYBOLD GROUP, INC., BOSTON

■ **Protocol vs. interface.** In distributed computing, protocols let net devices communicate. The Open Systems Interconnection model defines seven layers of protocols, ranging from physical-layer protocols to application-layer protocols such as X.400.

In an object-oriented context, an interface defines the protocol required to speak to an object. This interface may be simply a required set of parameters or a more formally defined protocol, such as X.400 or the Object Management Group's Common Object Request Broker Architecture. Interfaces can express both low-level protocols, such as a required set of parameters, and application-level protocols, such as X.400.

■ **Process vs. object.** In distributed computing, all entities are processes. A process is a thread of execution roughly corresponding to a running program and has a distinct network address.

In an object-oriented context, an object is equivalent to a process. However, the object-oriented world contributes to this basic concept the additional characteristics of encapsulating functions with data. The result is a more independent representation of function and data that is better suited for reuse by other objects in a network.

■ **Communications links vs. messages.** In distributed computing, applications interact using communications links of varying descriptions, including links set up using such programming tools as Sockets in the Transmission Control Protocol/Internet Protocol world, LU 6.2 in the IBM arena and other application program interfaces. These links enable applications to share access to files by establishing a synchronous communications session or by using an asynchronous datagram service.

In object-oriented computing, objects communicate using messages. Messages are an inherently asynchronous way of communicating. However, messages can be implemented using a variety of communications links, including the synchronous sessions found in IBM Systems Network Architecture environments. An object's ability to send a message to another object is typically encoded into the object itself. Thus, developers can use communications mechanisms without having to become network programmers.

■ **Function vs. method.** In distributed computing, functions are processes that perform particular operations on data, such as calculations or database queries. Many distributed applications enable a client to use a function stored on a remote computer.

In object-oriented computing, object methods are functions. Users can associate functions with data to create objects. Thus, to invoke a function on a particular data set, the user doesn't need to ship the data to the function. Rather, the object knows where the data is and will retrieve it to perform the requested function.

■ **Type vs. class.** Many distributed computing systems use types as a way to classify system elements, making it easier to identify common operations and characteristics. A Boolean type, for example, can take either true or false values. However, type systems typically do not support inheritance whereby one type of operation is supported by another type to create a new kind of element.

In object-oriented computing, type is used to define the interface to an object. Class is used to describe a hierarchical arrangement of objects that share support for common methods and can inherit data, methods and attributes from one another. The benefit of class is that existing objects can be used to create new objects.

■ **Client and servers vs. objects.** Lastly, in distributed computing, devices and applications are usually either clients or servers. Clients request functions, while servers perform functions.

A database client, for example, would submit an SQL statement as a request to a database server and would receive in response a set of results that satisfies the criteria in the SQL statement.

> An object's ability to send a message is typically encoded into the object itself.
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In object-oriented computing, clients and servers play different roles. The object-oriented model for applications is inherently a peer-based architecture. Concepts such as client/server are just roles that objects play in an application, and objects may play both roles in a given application.

— John Rymer

(continued from page 29)
brings the concepts of class and inheritance to network computing. The class concept enables developers to group objects that share behaviors so they can be used to create new objects.

Developers can create new objects by inheriting the behaviors of existing objects, adding new behaviors to an existing class of objects or overwriting functions of an inherited behavior.

A set of object classes that addresses a particular subset of system functionality, such as a graphical user interface, is called a class library.

Merging distributed computing with object-oriented technology enables developers to assemble applications from objects stored on clients or servers.

The terms used to describe distributed computing and object-oriented technology concepts share similar meanings, enabling users who understand distributed computing concepts to quickly grasp object-oriented technology concepts and vice versa (see "Different terms but similar meanings," page 29).

Architectural view

Distributed object computing is not a radical departure from available approaches to distributed computing. A distributed object computing environment includes many of the services associated with distributed computing environments, such as the Open Software Foundation, Inc.'s (OSF) Distributed Computing Environment, SunSoft's Open Network Computing, and Novell's NetWare 4.0.

Therefore, distributed object computing can be viewed as an extension to classic distributed computing services.

The major components of a distributed object computing architecture are communications services; distributed directory services; object definition facilities; distributed file, data and object management services; security; administration; and management.

There are at least three categories of distributed object computing products on the market today: object DBMSs, object request brokers (ORB) and message queuing platforms.

Object DBMSs are essentially DBMSs for objects. ORBs and message queuing platforms have become known as middleware, or software that enables clients to communicate with network servers. Each of the three product categories touts certain characteristics, but, to date, not one of these is a one-size-fits-all solution.

An object DBMS stores and retrieves objects, which are usually defined in an object-oriented programming language, such as C++ or SmallTalk. The object DBMSs from Object Design, Inc. and Ontos, Inc., both of Burlington, Mass., Objectivity, Inc. and Versant Object Technologies, Inc., both of Menlo Park, Calif., Servio Corp. of Alameda, Calif., and others are all based on a client/server architecture.

Thus, when users obtain these products, they also adopt architectures to manage objects in a distributed environment.

Some of the object DBMSs support greater distributed networking than others. In particular, those systems from Versant Object Technologies and Objectivity manage objects stored in multiple physical databases as a single logical database. This enables an engineer at one workstation to use an object to represent a wireframe design view of an airplane wing, while a manufacturing process planner can use the same object to perform a manufacturing analysis for that wing.

Because the same object is used by two people simultaneously, some object DBMSs provide a synchronization service that coordinates the changes both users make to the object. This coordination effort can track the changes each user made, in essence, creating copies of the same object for each user.

This approach ensures that users will see only the changes they made when the object is called up. Alternatively, a user calling up an object changed by someone else can be alerted that changes were made.

Relational DBMSs offer only the ability to change one record at a time and don't coordinate changes to information viewed by more than one person at a time. This limits the ability of a relational DBMS to manage objects.

The best known distributed object computing approach is using an ORB — software that enables developers to define existing applications, files, network services and even devices as objects. These objects include software interfaces that enable them to communicate with one another, reside in class hierarchies, and encapsulate data, attributes and methods.

Objects created using an ORB are stored in network databases, which do not necessarily have to be object DBMSs. The ORB finds where objects reside and passes requests for services and responses to those requests between objects (see Figure 2, this page).

The OMG's Common ORB Architecture (CORBA) standard is probably the most widely known ORB implementation. CORBA, which defines an interface that enables clients to use ORB services, was put together by DEC, HP, HyperDesk, NCR Corp. and SunSoft under the auspices of the OMG. DEC, HyperDesk and NCR each have ORB-based products on the market. DEC's and HyperDesk's ORB products are partially CORBA-compliant. NCR does not yet have a CORBA-compliant product, while HP and SunSoft are expected to introduce products later this year.

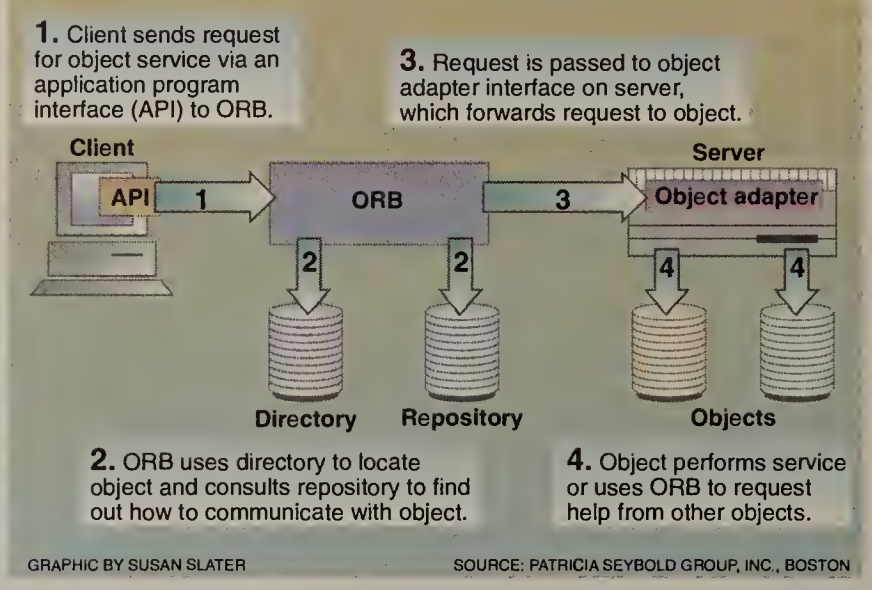
An ORB is also at the heart of the Wizdom systems management product from Tivoli Systems, Inc. of Austin, Texas, and the OSF's planned Distributed Management Environment (DME). The DME seeks to unite network and systems management functions in a single platform. It is built, in part, on Tivoli's technology. Tivoli uses an ORB to define management objects and manage communications among them. The approach simplifies the addition of new managed objects to a system and transcends the many underlying management protocols used today.

"Distributed object computing makes a lot of sense in the area of network or systems management because now you have a way — with objects — to much more easily manage applications and resources anywhere on the network," says Robert Shelton, editor of the "Hotline on Object-Oriented Technology," a San Francisco-based industry newsletter on object computing.

The last architecture, a message queuing platform, is a special holding area on a net device where requests for service and responses to those requests are stored until they can be acted on. By maintaining queues for incoming and outgoing messages, these platforms let applications transmit and receive multiple messages without waiting for each message to be processed in sequence (see Figure 3, page 31).

Object request broker at work

Figure 2



GRAPHIC BY SUSAN SLATER

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For example, a message queuing platform accepts messages from one application and posts them in a queue so that a remote application can pick them up and act on them. Queues may be in memory or, for greater reliability, file-based. A typical use for a message queuing platform would be to pass data from an order entry application to a factory production management application at specified times each day.

Message queuing platforms encapsulate complex communications APIs into simple command structures that are easy to use for developers unfamiliar with communications protocols. For example, many message queuing platforms present IBM's set of hoary LU 6.2 command verbs to developers as simple commands such as SEND, RECEIVE and REQUEST STATUS.

Major message queuing platform vendors, including Horizon Strategies, Inc. of Needham, Mass., PeerLogic, Inc. of San Francisco, Systems Strategies, Inc. of White Plains, N.Y., and Covia Technologies, Inc. of Northbrook, Ill., are readying products that simplify the use of Transmission Control Protocol/Internet Protocol, DECnet, NetWare's Internetwork Packet Exchange (IPX), and IBM's Network Basic I/O System.

Message queuing platforms support the message passing paradigm of object-oriented technology. Messaging systems allow developers to define pairs of communicating applications, along with the parameters required for communications.

But these platforms do not support object orientation's other features. For instance, message queuing platforms don't offer inheritance as a means to build objects. Several message queuing platform vendors intend to extend their products to support inheritance hierarchies. Eventually, today's message queuing platforms will become tomorrow's distributed object computing systems.

The net effect

Because they are based on message passing, these three distributed object computing architectures will seriously stress today's networks. They will eventually push networks to the breaking point by driving up traffic.

Yet distributed object computing applications cannot be faulted because they increase network traffic. These applications are simply making the highest and best use of networks to accomplish their work. Furthermore, these applications continue the trend of using networks to build useful applications, a trend that started when companies moved host applications to LAN-based platforms.

Early adopters of distributed object computing report a much higher level of network resource utilization than ever before. The patterns in early adoption sites point toward a future with much higher bandwidth requirements than are typical today.

Distributed object computing applications cannot be faulted because they increase network traffic.

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In fact, Kash-n-Karry Food Stores, Inc., a chain of grocery stores in Tampa, Fla., is installing a fiber-optic network and T-1 lines to support its distributed object computing architecture. The new network replaces an older Ethernet and IBM Systems Network Architecture environment.

The upgrade was required, says James Stikeleather, manager

of systems development at Kash-n-Karry, to keep pace with the volume of communications in the chain's distributed object computing environment. "We look at the network as one big computer," he says. Kash-n-Karry uses objects to facilitate access to information, and the result has been a dramatic rise in network traffic.

Yet this traffic is much more efficient than the communications traffic generated by Kash-n-Karry's old applications, which were based on IBM mainframes.

Objects in Kash-n-Karry's network communicate in a connectionless manner, which eliminates the SNA requirement to build up and tear down sessions for each interaction between a terminal and application. Therefore, more network bandwidth is devoted to exchanging information between objects and less is devoted to the overhead of maintaining terminal-to-host sessions.

At this stage of distributed object computing's evolution, there are no hard and fast rules for designing applications. Developers must achieve the best balance between network efficiency and application functionality that suits their particular business requirements.

However, early user experience shows that the way an application is designed has a direct effect on the amount of additional traffic generated. Distributed computing assumes that a significant portion of an application's processing will be performed on client devices rather than on servers, thus limiting the number of objects that must communicate over the network.

By contrast, client/server architectures that require all processing to be done on the server and display functions on the client result in heavy network traffic loads.

Likewise, a distributed object computing application that requires clients to continually ask the server for objects in order to support each task will result in heavy messaging traffic on the network. Traffic can be kept to a minimum if clients are designed to retrieve clusters of objects via a single message.

Because clients are so important in distributed object computing, they tend to require hefty amounts of memory and processing power. Early users have typically found that they need at least an Intel Corp. 80386-based personal computer with 4M bytes of random-access memory to support distributed object computing applications. These users also find it necessary to tap Unix-based Reduced Instruction Set Computing systems as servers.

Server architecture can also have an impact on network loading in distributed object computing environments. Kash-n-Karry's architecture distributes objects across several servers and manages those objects as a single image. The distributed approach spreads object messaging traffic across multiple servers.

Other companies are using client/server architectures that place all shared objects on a single server. By concentrating shared objects in a single server, all messaging traffic will be focused on that server.

Strategic benefits

Despite the networking drawbacks, distributed object computing yields four strategic benefits. First, development of distributed applications is greatly simplified. To build an application, developers must master fewer details because those details have become part of the embedded intelligence that objects support in software.

For example, an object that can translate requests for information from a proprietary format into a Simple Network Management Protocol or Common Management Information Protocol (CMIP) format would be useful to many network management applications that must collect information from both SNMP and CMIP devices.

Once constructed, objects can be reused in multiple applications, which is another benefit. For example, multiple applications can use the object that translates proprietary requests for management data into SNMP or CMIP formats. Therefore, software developers don't have to rebuild the same functionality over and over again in each application.

Code reuse isn't automatic or easy, but it is a benefit of using objects — and a benefit of great importance to corporate computing strategies. Reusable code not only promises to save corporations money on software development, but it also promises to dramatically improve the quality of software. Included in the design of reusable objects is a rigorous testing process that can reduce the number of bugs in the final application.

> Clients tend to require hefty amounts of memory and processing power.
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The third benefit of distributed objects is interoperability and information sharing. Objects that enable disparate systems to communicate or that represent network protocol stacks, different application environments and database APIs can be used by multiple applications. By enabling applications to use such objects, developers can easily build applications that communicate across disparate platforms.

The need for interoperability is what drove POSC to select distributed object computing as its architectural model. "To create applications that are plug and play across the industry, we are defining a data model that exhibits object-oriented characteristics," says Alan Doniger, data access project leader at POSC. "As an industry, we need to share and exchange data in diverse applications, and, inevitably, the use of objects will help us deal with networking issues to do that."

Lastly, distributed object computing supports multimedia and complex interactive applications. In object-oriented systems, video, voice and images are treated the same as other types of data that can be modeled as part of an object. By contrast, relational DBMSs require special subsystems or applications to support these new data types. Even with such DBMS add-ons, users have to fiddle with the underlying database's architecture.

Support for multimedia prompted Pacific Bell of San Francisco to adopt a distributed object architecture. The local telephone company recently deployed an application that moves sound, animation, text and graphics that describe company policies, as well as state and federal regulations, over a company-wide network linking 50,000 employees. The system is built on GainMomentum, an object-oriented layer implemented on top of a Sybase, Inc. DBMS. The product is sold by Gain Technology, a Sybase subsidiary.

Applications involving complex interactions are also well suited to distributed object computing architectures. Kash-n-Karry uses its distributed object computing system, in part, to perform business simulations. In the food chain's network, objects correspond to the everyday elements of the grocery business, such as items, prices, shipments and returns. Users can test the effect of pricing changes, supplier-management policies and personnel changes on the business by changing one object and seeing how other objects react.

Objects are a good way to build these kinds of systems because the number of possible interactions required to simulate a business situation is impossible to predict. Only in a system architecture where individual elements are self-defining can intelligent entities hope to support simulation applications.

> Despite the drawbacks, distributed object computing yields four strategic benefits.
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Getting there from here

Last year, many users started recognizing distributed object computing as a distinct architecture. For the next two years, users will start migrating to distributed object computing with the aid of more robust tools.

Early adopters haven't had an easy time making the transition to distributed object computing for a variety of reasons. The tools available to support distributed object computing are new and largely unproven. Also, many early adopters had to build some of their own tools to achieve their goals. Finally, few corporate developers are experts in designing object-oriented applications.

For many network managers and chief information officers, however, the strategic benefits of distributed objects outweigh the costs of education and training associated with a move to a new architecture.

The number of distributed object computing tools will grow next year and will undoubtedly make migration easier for a broader user base. However, the biggest mistake users can make in planning their move to distributed object computing is to underestimate the magnitude of the transition.

Distributed object computing is not an incremental enhancement of a well-understood set of development and management methodologies and structures. It is a comprehensive strategy for building distributed systems. The migration from today's centralized architectures and procedural development tools will take years to complete.

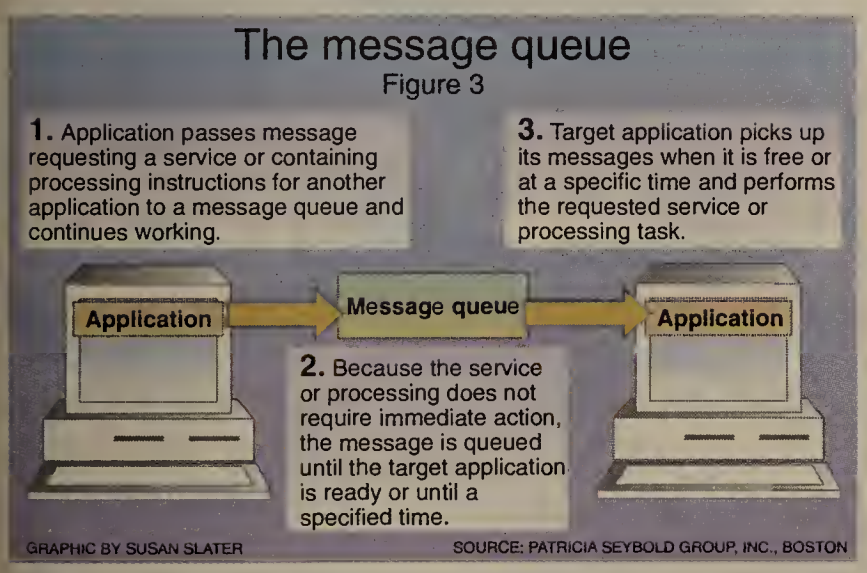
The best way to start working toward distributed object computing's promised benefits is to start today to learn about object-oriented software design, available tools, methodologies and management practices that have produced results for early adopters. There is no profit in waiting when there is so much to learn and such compelling benefits to obtain.

Rymer is vice president of the Patricia Seybold Group, Inc. and editor in chief of the "Distributed Computing Monitor," a monthly analysis report. He is also chairman of the annual Patricia Seybold Marathon Week conference on distributed object computing and open systems.

Staff Writer Timothy O'Brien contributed to this article.

The message queue

Figure 3



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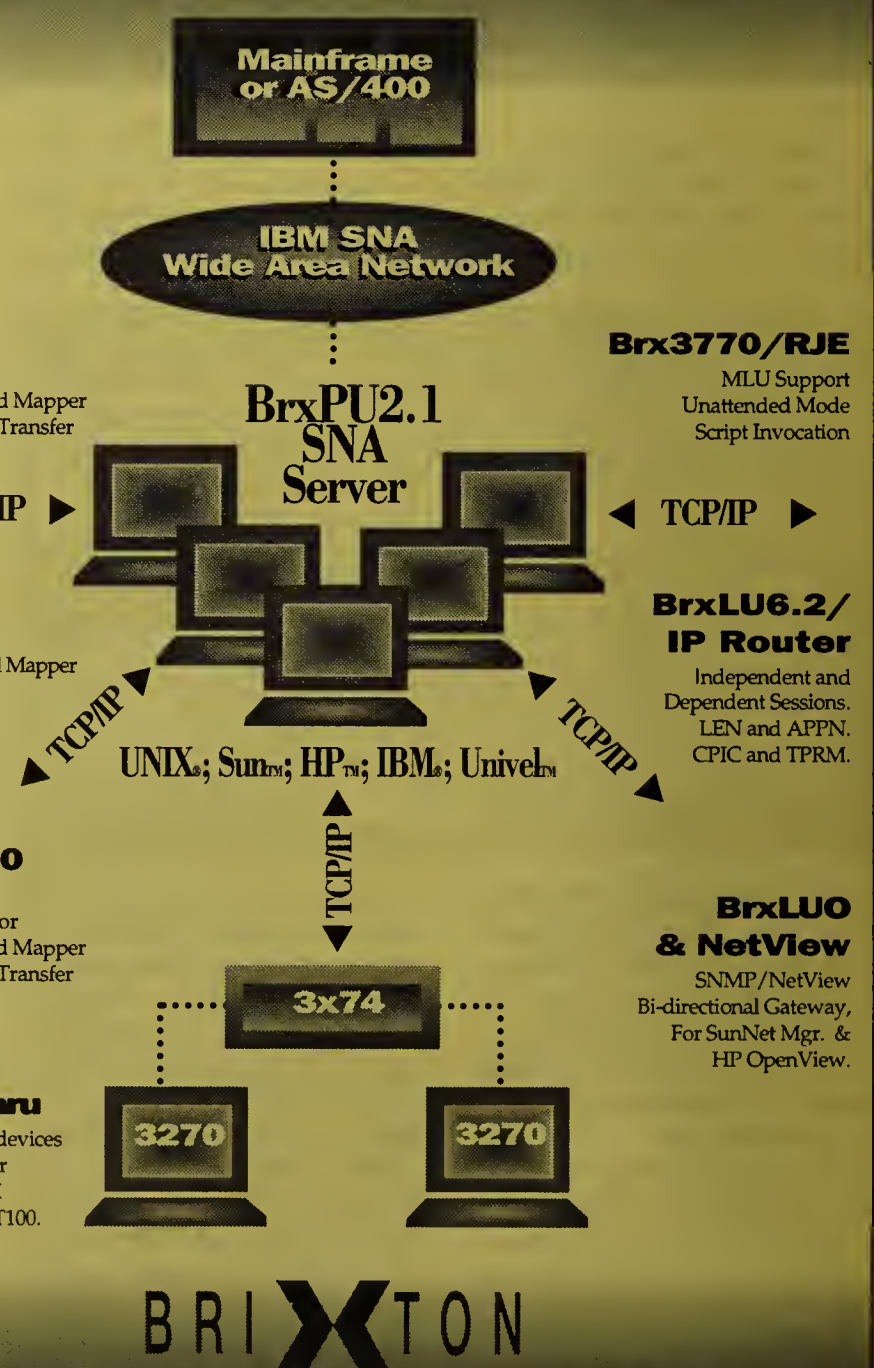

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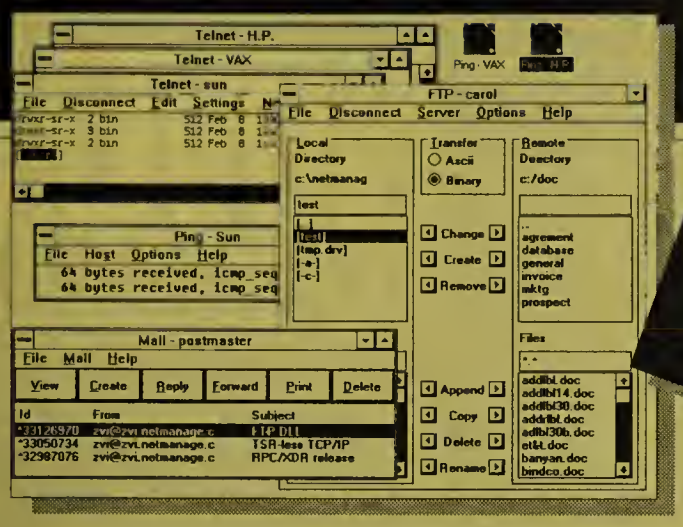

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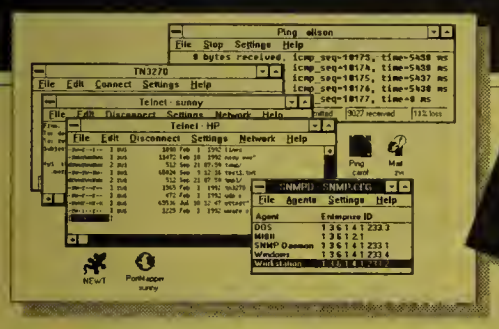

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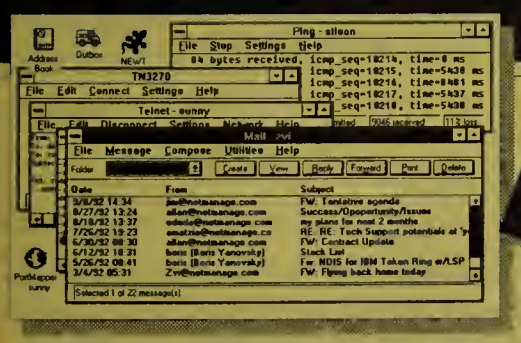

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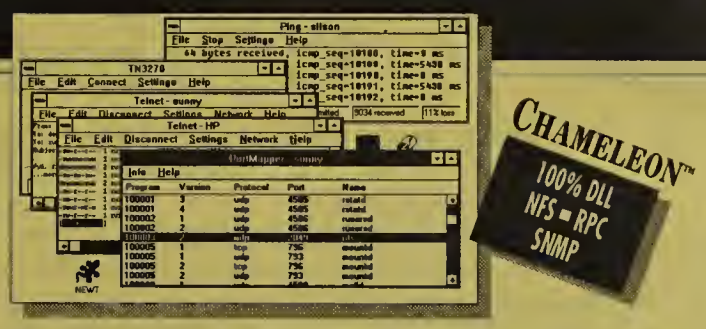

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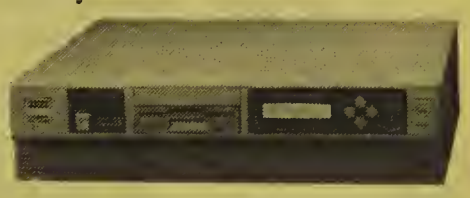

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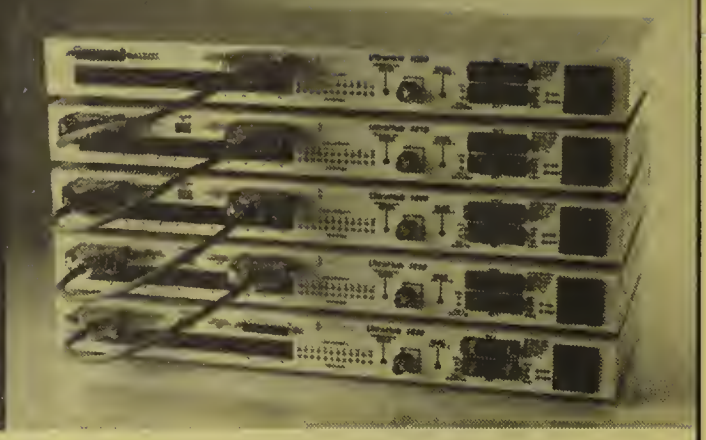

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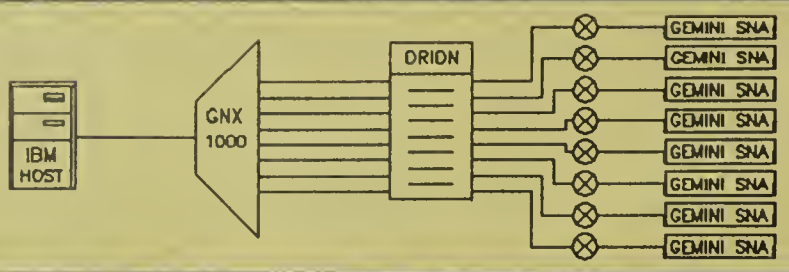

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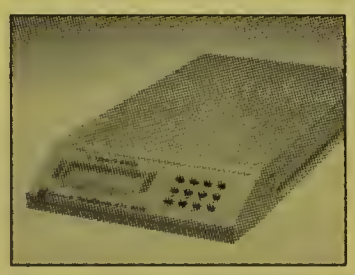

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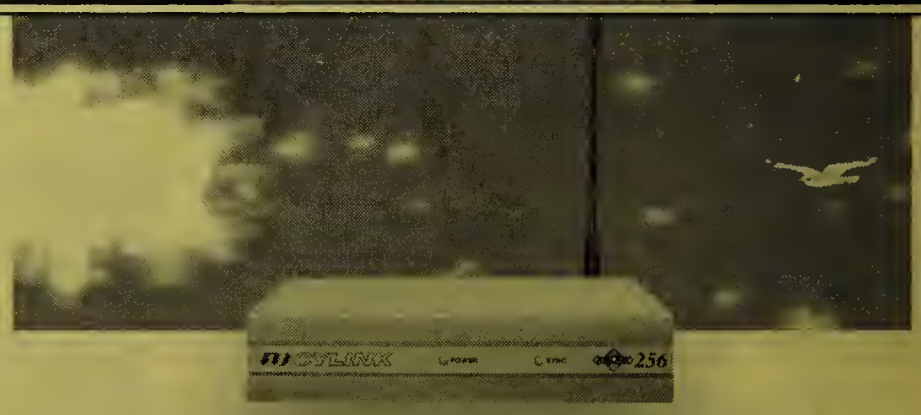

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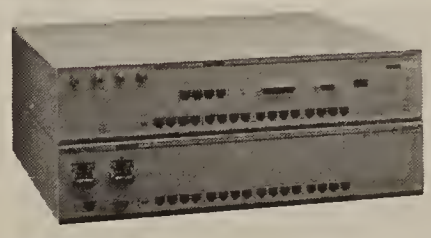

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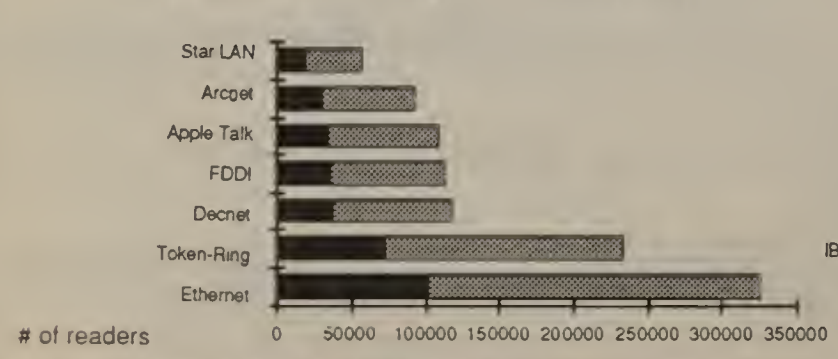

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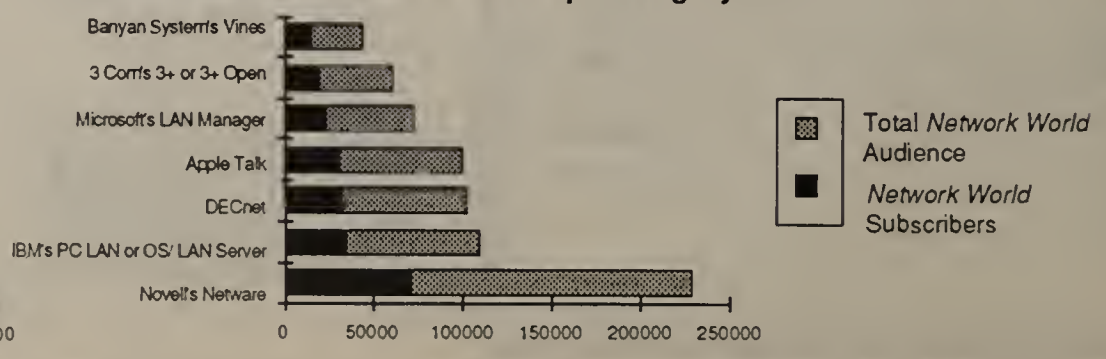

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Digital H/W for LAN products - BS/MSEE, 3+ years' relevant experience, and a strong digital emphasis in school and understanding of analog design are necessary.

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Hadax adds mgmt. to hubs

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network management present.

Another feature that sets the 110 apart from the rest of the RingTamer line is its SNMP support, including the SNMP Management Information Base II. The hub has a built-in SNMP agent that allows one 110 hub to manage as many as 256 other RingTamers via an attached management workstation running the Hewlett-Packard Co. OpenView net management system.

The hub, which supports fiber-optic as well as both shielded and unshielded twisted-pair connections, can continue to operate as a dumb MAU in the event of a power failure. The 110 also has flash erasable programmable read-only memory, which will automatically reconfigure the hub when power is restored.

Available in the second quarter, the RingTamer 110 costs $2,195.

NetWare users to get help

continued from page 1

New York, but also "the basis for pricing." Bond is also chairwoman of Open User Recommended Solutions (OURS), a nonprofit group that recently published a white paper on software licensing.

Added Darrell Ackmann, secretary of the board at OURS and director of business strategy for Software AG of North America, Inc. in Reston, Va., "Customers have been asking for something that bears a more rational relationship to how they're actually using software. Humans can't keep track of it anymore; a tool is now mandatory."

ESL gives users the tools they need in order to manage the electronic acquisition and administration of software licenses across the network. Bringing ESL to NetWare will help users control their liability, rationalize the cost of their software and make better use of their software assets.

Application vendors, meanwhile, can use the technology to satisfy customer needs and protect their own intellectual property.

More important, ESL can help vendors create new software licensing options and open new distribution channels.

"There's a definite need out there," said Jan Newman, executive vice president of Novell's NetWare Systems Group. "It's not just, 'Am I legal?' It's a lot broader than that."

Innovative licensing arrangements might include: node-locked licenses that allow an application to be launched only from a particular desktop; concurrent, or floating, licenses that let a given number of nodes use the application at a given time; demonstration licenses that limit the use of an application to a specific time period or number of executions; personal use licenses that restrict an application to certain users; and usage-based licenses that are priced according to how intensively the application is used.

For developers who write to the new API, Novell said the NetLS NLM offers better control of their intellectual property and revenue, the opportunity to reduce sales and media costs through electronic distribution of demonstration and other types of licenses, and more flexibility in meeting customer needs.

Novell expects to release the NetLS NLM this year, while the NetLS SDK is due in the third quarter. The company has not yet determined whether the NLM will be included in the NetWare open system or sold as an add-on, Newman said.

NETWORK WORLD

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BT sets goal to expand access

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speeds, said Jefferey Zanardi, a manager with BT's network product management group. In September, BT will begin adding support for dial access at 14.4K bit/sec to many of these spots.

BT is the first carrier to announce plans to support V.fast, an emerging standard for full-duplex dial-up modems that can achieve speeds up to 28.8K bit/sec. BT will implement V.fast — which is supported by more than 60 modem makers — six months after the specification becomes a CCITT standard, which could be before the end of this year.

The carrier said that, beginning in September, it will also support V.42 error correction, a CCITT data compression standard for V.22, V.22bis, V.26ter, V.32 and V.32bis modems. V.42bis compresses files at an average ratio of roughly 4-to-1. Used with 2,400 bit/sec modems, V.42bis can provide throughput of up to 9.6K bit/sec, and when used with 9.6K bit/sec modems, up to 38.4K bit/sec.

"This announcement is very timely for us because we need to offer 1,100 dealerships quicker access and more bandwidth," said Tony Lucente, manager of dealer services for BT user Nissan Motor Corp.

In the third quarter, the carrier also plans to offer Feature Group B access, enabling users to access the BT net by dialing a single, local toll-free 950 number.

With mobile workers in mind, BT has set December as a target delivery date for adding wireless network access. BT sales representatives will sell wireless access from Cellular Digital Packet Data — a consortium of cellular carriers — and Cellular Data, Inc. BT will also sell radio access from RAM Mobile Data, Inc. In both cases, local access fees will be included with BT network service usage charges on monthly invoices.

Additionally, BT plans to offer users switched digital access, initially at 56K bit/sec. Zanardi said the carrier will eventually support switched services at speeds up to T-1 as well as fractional T-1 links, a move that will require BT to install special channel service unit/data service units in its access locations.

A BT spokesman said the carrier would like to support these access links in the fourth quarter of this year but probably will not be able to do so until the first quarter of 1994.

BT among VANs with wide access support

Network or service	Bit/sec				
	9.6K	14.4K	19.2K	28.8K	56K
Advantis	A	C	B		B
AT&T EasyLink Services	A	A	C		B, C
BT North America, Inc.	A, C, D	A (Sept.), D	D	A (announced)	B (year end), C
Cable & Wireless Communications, Inc. Managed Data Services	A				C
CompuServe, Inc. Packet Services	A, C				
GE Information Services	A	D	D		
Graphnet, Inc. GraphPak	A	C	C		C
Harbinger*EDI Services, Inc.	A	A			
Infonet Services Corp. Public Data Network, Virtual Private Data Network, Infolan, Notice	A	D	D		C
MCI Mail	A				
SprintNet	A, C, D	A(year end), D	D		C

A = Dial-up
B = Switched digital
C = Dedicated digital
D = Dedicated analog

SOURCE: TELECHOICE, INC., MONTCLAIR, N.J.

Start-up announces wares

continued from page 4

isting FDDI chipsets, ALFA has developed software drivers for the adapters that can differentiate between synchronous and asynchronous traffic.

To support multimedia applications, users establish separate channels for asynchronous and synchronous traffic on the concentrator backplane. The synchronous bandwidth can support dedicated connections between end nodes for a videoconference or a high-speed file transfer.

The nonsynchronous FDDI users on the network can continue to operate without interruption.

ALFA's A2000 eight-port FDDI concentrator supports multimode fiber, shielded and unshielded twisted-pair connections, and dual- and single-attached stations. Available now, it is priced between $5,000 and $7,500.

The company is offering adapters for Extended Industry Standard Architecture (EISA)-, ISA- and SBus-based personal computers and workstations. Also available now, they are priced between $995 and $1,645.

According to Brian Cashman, manager of network hardware engineering at the University of Michigan at Ann Arbor, synchronous FDDI was attractive but may have a limited window of opportunity.

"Some of the advantages of synchronous FDDI include the fact that it's here now, exists in chips and hardware products, and basically requires a software trigger," he said. "Users need to be careful, however, because FDDI 2 and [Asynchronous Transfer Mode] are coming down the road — which may be more robust solutions."

NSC lays out SNA plans

continued from page 4

APPN Network Node, providing users with peer-to-peer routing of SNA. Also, catering to users with relatively homogeneous SNA nets, NSC will offer by 1995 an APPN encapsulation scheme that will enable users to employ APPN to transmit nonroutable IBM protocols — such as Network Basic I/O System and LLC2 — across their internets.

This contrasts with the strategies of other router vendors, which have chosen to encapsulate those protocols inside a TCP/IP envelope. NSC said it will also offer a TCP/IP encapsulation scheme for users with large TCP/IP-based internets.

In related news, NSC said it will release an ATM switch next year that combines the functions of a multiprotocol router and a wide-area ATM matrix switch.

The ERS will provide integrated ATM switching and high-speed routing. It uses a switching matrix to support 53-byte ATM cells as well as 64-byte cells for direct connections to Ethernet, token-ring and Fiber Distributed Data Interface LANs and wide-area network interfaces.

The device will consist of a 16-slot chassis that will support up to 50 Ethernet and Token-Ring LANs, or up to 15 FDDI LANs. On the WAN side, it will support as many as 120 T-1 lines or up to 15 T-3s. The vendor said it still has to define the number of ATM wide-area interfaces the ERS will support.

The ERS will have a switching backplane capacity of 1.6G bit/sec and a minimum packet forwarding rate of 175,000 packet/sec. It will also come equipped with redundant power supplies and processors, hot-swappable interfaces and automatic reconfiguration capabilities.

Pricing has not yet been set.

Deal focuses on interoperability

continued from page 3

protocols and bridging algorithms.

The firms also entered into a technical support alliance that will provide a single point of contact for users with products from both companies. Wellfleet's and Novell's technical support groups will have the ability to troubleshoot networks, regardless of whether the problem stems from a Wellfleet or NetWare node.

The two companies may extend the agreement to include joint services for network design, installation and configuration.

The companies also said they are working to develop a common net management platform for Wellfleet and Novell routers but declined to provide specifics. Steve Magnuson, a senior communications engineer at Northern States Power Co. in Minneapolis, applauded the partnership. With 24 Wellfleet routers and 60 Novell file servers dispersed throughout his local-area network internet, Magnuson said NLSP will enable him to better utilize his wide-area network bandwidth. More than 60% of the traffic traversing his internet today is IPX-based.

He added that product interoperability will also enable him to consider deploying Novell's multiprotocol router in remote sites to tie them into his Wellfleet-based backbone.

"I have a number of small sites where I can't justify the cost of a full Wellfleet router," Magnuson said. "But strict interoperability with my current router net is a must before I will put the Novell routers in those sites."

Kanwal Rehki, executive vice-president of Novell's Interoperability Systems Group, said the partnership with Wellfleet is non-exclusive, and Novell may work out similiar agreements with other router vendors.

Michael Howard, president of Infonetics Research, Inc. in San Jose, Calif., said Wellfleet is leading a charge that users can expect other vendors to follow.

"There is a branch office explosion going on now in the internetworking area, with users interested in tying small remote offices — many of which have NetWare LANs — to larger sites via a router backbone," he said. "This kind of agreement will give NetWare users with a Wellfleet router-based internet a good comfort level."

SynOptics braces ATM plan

continued from page 2

companies will develop an SBus adapter for Sun's SPARCstation workstations that will connect to SynOptics' ATM switch at 155M bit/sec — the industry's first adapter to run at the Synchronous Optical Network Optical Carrier-3 rate.

> Sun has invested in protocol development for ATM networks, which it plans to share with SynOptics and implement in the future.
>
> ▲▲▲

The new SBus card will conform to ATM Forum interoperability specifications and support fiber, shielded or unshielded twisted-pair wiring. It will feature Sun segmentation and reassembly chip technology that will convert packet traffic from the workstation into 53-byte ATM cells.

Sun has also invested in protocol development for ATM networks, which it plans to share with SynOptics as part of a deal with SynOptics and implement in future ATM products that the two vendors are jointly developing.

Pricing for the cards will start at less than $1,300, which is competitive with workstation adapters from Newbridge Networks Corp.'s Newbridge Microsystems division (see "Newbridge paints a VIVID net portrait," page 1).

Management wares

SynOptics' ATM management offerings will include its Connection Management System and the LattisCell ATM Network Management Application.

The Connection Management System software will run on a Sun SPARCstation and provide call setup, maintenance and teardown. It will support both switched and permanent virtual circuits, will reroute calls around failed circuits and can automatically learn network topology and client addresses.

This software will be released in the third quarter and cost $4,495.

The LatisCell ATM Management Application will run on SunNet Manager and provide management of LattisCell ATM switches. It will be integrated with SynOptics' Optivity management product to provide consistent management of ATM and other media access methods.

The application will be available in the third quarter and cost $3,495.

Defense sees nets as cushion

continued from page 1

to civilian production, cut costs and withstand the loss of jobs. Networking is also giving these staunch rivals new ways to work together to win business.

"With the changes occurring in this industry, the role of technology will become more important," said Maralyn Rosenblatt, senior telecommunications systems specialist for Lockheed Corp., a Calabasas, Calif., defense firm. "Effective use of networking, in particular, will assist companies in becoming more competitive in this marketplace."

> "Effective use of networking will assist companies in becoming more competitive."
>
> ▲▲▲

Vote of confidence

Hughes Aircraft Co. is among the biggest believers that investment in networking is a key to survival in the fast-changing aerospace and defense market.

The company recently released requests for proposals to revamp its existing network with Asynchronous Transfer Mode (ATM)-based technology later this year. George Buchanan, Hughes' manager of telecommunications, said the net upgrade grew out of a corporate restructuring and upper management's imperative to improve communications across departments.

The network also promises cost savings. ATM, a bandwidth-on-demand technology, can help Hughes eliminate expensive private lines. ATM will also provide a common platform that enables the company to make applications available from anywhere on the network, instead of having to support them in multiple locations, Buchanan said.

In transition

Raytheon Co. is trying to meet the challenge of a shrinking military budget by leveraging its defense-related expertise in commercial markets. Jerry Satkus, manager of communications and personal computer services at Raytheon's Submarine Signaling Division in Portsmouth, R.I., said networking is the key to bringing the firm's divisions together.

"Network services have allowed us to share information among divisions," he said. "The efficiencies we've gained have enabled us to improve revenue in a declining market."

During the past three years, Raytheon has focused on networking as a way to increase knowledge sharing and to cut costs. "For every PC added to the network, we save $1,000 a year," Satkus said, citing improvements in resource sharing and concurrent software licensing.

Raytheon is looking to implement Fiber Distributed Data Interface throughout its divisions to speed up this resource sharing.

Targeting costs

Northrop Corp. is continuing to invest in networking as a way to keep competitive and with an eye to cutting costs. "We have a new emphasis on cost when evaluating technologies," said Rob Goldberg, principle network technologist at the Los Angeles-based firm.

For a recent project supporting the design, engineering and manufacturing of the F-18 aircraft, the networking group at Northrop evaluated all technology solutions using a return-on-investment (ROI) profile — a new procedure for the networking side of the house.

"In the past, we concentrated on supporting applications, and the cost of networking was an afterthought," Goldberg said. "Now we try to find the most cost-effective ways of doing it."

Through the ROI process, "it became apparent that one of the greatest costs was network failure," he said. "That made it important that every networking component be fault-tolerant."

Although it may have cost a bit more initially to install the redundant equipment supporting the project's fault-tolerant FDDI backbone, the investment was worth it, considering the company projected that it would lose up to $400,000 per hour of network downtime.

Aerospace and defense firms are also turning to networks to support joint contract bids, a popular strategy given the shrinking number of big contracts.

Boeing Co., General Dynamics and Lockheed relied heavily on videoconferencing, high-bandwidth networking and electronic messaging to communicate while preparing their successful bid to build the F-22 Advanced Tactical Fighter for the U.S. Air Force. Their ongoing work on that program continues to be supported via networking.

"Effective use of telecommunications and computing technologies are essential in these partner arrangements," said Lockheed's Rosenblatt. "Team members are usually located at disparate sites and networks facilitate the exchange of information."

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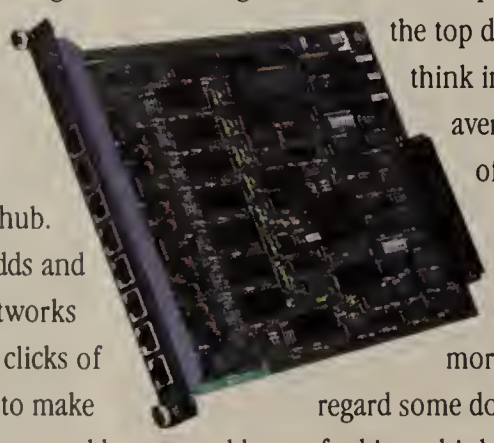
Given Chipcom's track record, no wonder the others have to sell on price.

OCTOBER 18, 1988

We created the first truly fault-tolerant hub. And we've been building high levels of fault tolerance into all our new hubs, modules and transceivers ever since. Because when you're talking about big mission-critical networking, any downtime is too much downtime.

JANUARY 29, 1990

We were the first to introduce a multi-protocol, multi-network intelligent switching hub. Suddenly, it became possible to run up to 3 Ethernet, 7 Token Rings or 4 FDDI networks, software configurable, in a single hub.



APRIL 29, 1991

We were the first to put Port Switching into an intelligent hub. With it, you can do moves, adds and changes, within or across networks or segments with a couple of clicks of a mouse. Without it, you get to make trips to the wiring closet and move cables. A lot of trips.

MAY 13, 1991

First with network self-healing. With our Network Control System software, our built-in fault tolerance and our Port-Switching technology, your network can not only tell you there's a problem, but is also smart enough to route itself around it automatically. Network service continues without interruption, while you schedule the fix at your convenience.

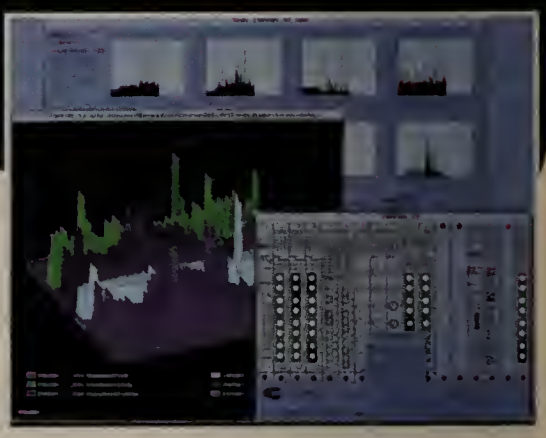
Chipcom has always seen networking differently than its competitors. Which, given the difference in our backgrounds, isn't surprising.

Instead of building products aimed at departmental LANs, Chipcom has always designed and engineered its products for networks of thousands of nodes. So it's only natural that while others see networking from the bottom up, we view it from the top down. While they think in terms of an average network life of three years, we see a corporate asset good for ten years or more. While others regard some downtime as acceptable, we find it unthinkable.

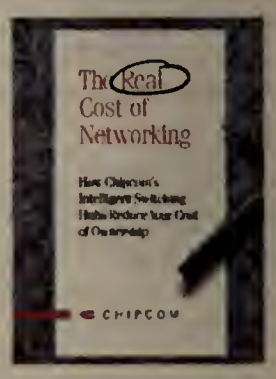
Because we see the network as a whole, we recognize that, while installation price is important, it really represents only 10–20 % of overall networking cost. So even though Chipcom's ONline System Concentrators cost no more to buy than less functional hubs, we encourage our customers to ignore outdated formulas like price-per-port, and to think instead about long-term savings, concentrating on the 80–90 % represented by network operation and maintenance.

And only the Chipcom architecture offers the combination of engineered-in reliability, the highest degree of fault tolerance, TriChannel™ flexibility, Port Switching and ONdemand™ Network Control System that results in huge savings over the life of your network.

For example, Chipcom's ability to eliminate closet-level moves, adds and changes alone can save you enough money to repay the entire cost of the network in just three years. Want to make us prove it? Call **1-800-228-9930**. Ask for your free copy of *"The Real Cost of Networking,"* the name of a Chipcom VAR near you, or to speak to a Chipcom representative.



Or what the heck, ask for all three.



See us at INTEROP Booth #1324

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